October 26, 2017

Ohio Environmental Protection Agency Division of Air Pollution Control Southeast District Office 2195 Front Street Logan, OH 43138

Re:

Rice Drilling D, LLC

**NSPS Subpart OOOOa Annual Report** 

RECEIVED

OCT 3 0 2017

AIR ENFORCEMENT BRANCH U.S. EPA REGION 5

To whom it may concern:

Rice Drilling D, LLC (Rice) is submitting the attached report for NSPS Subpart OOOOa, as required by 40 CFR §60.5420a(b). This report contains the information specified in §60.5420a(b)(1), (b)(2), (b)(7), and (b)(8).

The report covers the period of August 2, 2016 through August 1, 2017.

Should you have any questions or comments about this submittal, please contact me at (412) 400-6887 or at kristin.ryan@riceenergy.com.

Sincerely,

Kristin Ryan

**Emissions Permitting Specialist** 

Rice Energy, Inc.

Cc:

Director, Air and Radiation Division

US Environmental Protection Agency, Region V

77 West Jackson Boulevard Chicago, IL 60604-3590

**Enclosures** 



# Rice Drilling D, LLC NSPS Subpart OOOOa Annual Report

# **General Information**

Company Name:

Rice Drilling D, LLC

Address:

2200 Rice Drive

Canonsburg, PA 15317

Reporting Period							
Start Date	End Date						
8/2/2016	8/1/2017						

_	_	_		
Rei	aort	Pre	อล	rer

Name:

Kristin Ryan

Title:

**Emissions Permitting Coordinator** 

Phone:

412-400-6887

Email:

kristin.ryan@riceenergy.com

**Certifying Official** 

Name:

Jide Famaugun

Title:

**VP of Production** 

Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature

Date

10/26/17

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Nke Drilling D. U.C. NSP5 Subpart COCOs Annual Report Gas Well Affected Facilities

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#### Rice Drilling 8, M.C. NSPS Subpart COOOa Annual Report

#### Pneumatic Pump Affected Facilities

Pneumatic Pumps Con-	structed, Modified, or Reconstructs	ed During the Repo	orting Period;							
Well Site	/b) /O)	City	County	State	Number of Pumps	No control device or process is available on site (X)	Technically infeasible to capture and route the emissions to the control device or process (X)	Emissions from the presumatic pump are routed to a control device or process <sup>2</sup>	Records of Derivations Occuring During the Reporting Period <sup>1</sup>	Communis
Big Dawg				OH	1		, in	<del> </del>	nepareng renou	PE certification attached
Bounty Hunter		<del></del>		ан	2			<del> </del>		PE cortification attached
Dr Awkward	\ /	Bethesda		OH	2		X X	1		PE certification attached
Dragons Breath				OH	5		<u>x</u>	<del> </del>		PE certification attached
Haymaker			Beimont	DH	2		<u>x</u>			PE certification attached
Iron Warrior		Belmont	Belmont	DH	2		×			PE certification attached
Junkyard Dog		Beallsville	Beimont	OH	3		X.			PE certification attached
Madusa		Belmont	Belmont	OH	2		X	7		PE certification attached
Monster Mutt		Beallsville	Belmant	CH	2		x	<u> </u>		PE certification attached
Spitfire		Powhaten Point	Belmont	OH .	1 2		×			PE certification attached
Taco Cat				OH	2		K			PE certification attached
Thrasher		Belmont	Balmont	CH	- 2		Х			PE certification attached
Tato Cat		Belmont	Belmont	OH	2		<u> </u>			PE certification attached
Tuna Nut		Sethesda	Belmont	OH:	1 2	L	x			PE certification attached

Pneumatic Pumps Pn	eviously Reported and For Which a Ch	enge in the Repo	rted Conditio	n Changed	During the Rep	orting Period:					
	_				ı —				Control device or process		
				j i	ſ		New control device and		was removed and now		
				[	l		technically indeasible to	Control device or process	technically infeasible to		
1		ì '	1	}	ì	1	capture and route the	was removed and now no	capture 2nd route the	ì	1
1		l .	l	[		New control device and	emissions to the control	control/process is available	emissions to another control	Records of Deviations	
		ľ	ľ	l		emissions are controlled	device	on site	devicé or process	Occuring During the	
Well Site	Street Address	City	County	State	Pump ID	(x)	(x)	(X)	(x)	Reporting Period <sup>2</sup>	Comments
N/A									1		

<sup>1)</sup> If the control device is designed to achieve less than 95 percent emissions reduction, specify the percent emissions reductions the control device is designed to achieve.

As specified in 40 CFR 60.5420a(c)(16)(ii).



40 CFR Subpart OOOOa Compliance Plan – *Production* 

#### Diaphragm Pumps

LOCATION COUNTY

Big Dawg Belmont (OH) 911 ADDRESS

(b) (9

WELL NAMES 1H-A / 3H-A / 5H / 7H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	January 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SIFE - Xes / No	No

Mary Commencer of Sty	
NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	January 2017
= APPLICATION =	Heat trace/insulation on dehy units
IN USE FOR, < 90 DAYS? – Yes I No	Yes – see documentation
ROUTED TO PROCESS - Yes? No	No
CONTROLLED - Yesy No	No

Comments			

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
  - b. Back-pressure on the diaphragm pump exhaust (~8-20 psig) can cause erratic stroke rate as the exhaust is configured to atmospheric conditions.
- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
  - a. No flame arrestor is currently installed to prevent backflash. Adding a flame arrestor in this application would result in varying degrees of backpressure continuously being held on the system. Also, a blockage could occur if exhaust system to burner is not properly maintained, resulting in erratic pump operation and excessive wear on internals, pump malfunction, or fire exposure.

Matthew G. Fox
Production Facilities Engineer
matthew.fox@riceenergy.com
Phone: 412-420-9392

Матиенс. С. Б. 10/20/17 Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-773

HARRIS



40 CFR Subpart OOOOa Compliance Plan - Production

#### Diaphragm Pumps

LOCATION COUNTY

Bounty Hunter Belmont (OH) 911 ADDRESS

(b) (9

WELL NAMES 2H / 4H / 6H / 8H

	·
NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	April 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	- No
CONTROLLED - Yes / No	No
GREENFIELD SITE ∴Xes / No	No
31 32	
NO OF DIAPHRAGM PUMPS	1
INSTALL DATE	April 2016

NO OF DIAPHRAGM PUMPS	1
INSTALL DATE	April 2016
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90-DAYS? -Yes / No	Yes – see documentation
ROUTED TO PROCESS Yes / No	No
CONTROLLED – Yes / No	No

Comments	

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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> Matthew G. Fox Production Facilities Engineer matthew.fox@riceenergy.com

Phone: 412-420-9392

MASTYEW 6. FOR

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

HARRIS



40 CFR Subpart OOOOa Compliance Plan - Production

#### Diaphragm Pumps

LOCATION

Dr. Awkward

911 ADDRESS

(b) (9)

Bethesda, OH 43719

COUNTY

Belmont (OH)

WELL NAMES

1H / 3H

May 2017
Glycol transfer pump on storage tank
Yes – see documentation
No
No
No

NO. OF DJÁPHRÁGM PUMPS	1
: INSTALL DATE :	May 2017
APPLICATION .	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No No
CONTROLLED – Yes / No	No

Comments						
		-	 			_

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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Matthew G. Fox
Production Facilities Engineer
matthew.fox@riceenergy.com

Phone: 412-420-9392

MATTHEW LIFOX

Cory Harris, P.E.
Environmental Engineer
cory.harris@riceenergy.com

Phone: 724-271-7718

CORYA. HARRIS E-82396

SONAL TITLE



40 CFR Subpart OOOOa Compliance Plan – *Production* 

# Diaphragm Pumps

LOCATION

Dragons Breath

911 ADDRESS

(b) (9<sup>-</sup>

COUNTY Belmont (OH) WELL NAME

WELL NAMES 1H / 3H / 5H / 7H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	July 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED - Yes / No	No
GREENFIELD SITE – Yes / No	No No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	July 2016
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS Yes / No	No
CONTROLLED – Yes / No	No

NO. OF DIAPHRAGM PUMPS	3
INSTALL DATE	July 2016
APPLICATION	Circulation pumps on evaporator
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments		1			
	<u>·</u>				
			<u> </u>	 	

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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"I certify that the assessment of technical infeasibility was prepared under my direction or supervision. I further certify that the assessment was conducted and this report was prepared pursuant to the requirements of §60.5393a(b)(5)(iii). Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

Matthew G. Fox Production Facilities Engineer matthew.fox@riceenergy.com

Phone: 412-420-9392

MATTHEW GIFOX

10/20/17

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

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CORY A. HARRIS E-82396

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40 CFR Subpart OOOOa Compliance Plan - Production

#### Diaphragm Pumps

LOCATION

Haymaker

911 ADDRESS

(b) (9)

Bethesda, OH 43912

COUNTY

Belmont (OH)

WELL NAMES

1H / 3H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	June 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	June 2017
. APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments		

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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Matthew G. Fox
Production Facilities Engineer
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Phone: 412-420-9392

10/20/17-

Cory Harris, P.E.
Environmental Engineer
cory.harris@riceenergy.com
Phone: 724-271-7718

CORY A. HARRIS



40 CFR Subpart OOOOa Compliance Plan – *Production* 

#### Diaphragm Pumps

LOCATION COUNTY

Iron Warrior Belmont (OH) 911 ADDRESS

(b) (9)

WELL NAMES 2H / 4H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	April 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	April 2016
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments		

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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40 CFR Subpart OOOOa Compliance Plan – Production

### Diaphragm Pumps

LOCATION COUNTY

Junkyard Dog Belmont (OH) 911 ADDRESS

(b) (9

WELL NAMES

1H / 3H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	January 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	January 2017
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments			

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
  - b. Back-pressure on the diaphragm pump exhaust (~8-20 psig) can cause erratic stroke rate as the exhaust is configured to atmospheric conditions.
- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
  - a. No flame arrestor is currently installed to prevent backflash. Adding a flame arrestor in this application would result in varying degrees of backpressure continuously being held on the system. Also, a blockage could occur if exhaust system to burner is not properly maintained, resulting in erratic pump operation and excessive wear on internals, pump malfunction, or fire exposure.

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NPHONEL, 724-271 77

HARRIS E-82396 Canonsburg, PA 15317

40 CFR Subpart OOOOa Compliance Plan - Production

#### Diaphragm Pumps

LOCATION

Madusa

911 ADDRESS

(b) (9)

COUNTY Belmont (OH)

WELL NAMES 2H / 4H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	July 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	July 2016
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No ·
CONTROLLED - Yes / No	No

Comments			

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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40 CFR Subpart OOOOa Compliance Plan – *Production* 

#### Diaphragm Pumps

LOCATION COUNTY

Monster Mutt Belmont (OH) 911 ADDRESS

(b) (9)

WELL NAMES 1H/

1H / 3H / 5H

NO. OF DIAPHRAGM PUMPS	1	
INSTALLED ON	January 2017	
APPLICATION	Glycol transfer pump on storage tank	
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation	
ROUTED TO PROCESS – Yes / No	No No	
CONTROLLED – Yes / No	No	
GREENFIELD SITE – Yes / No	No	

NO. OF DIAPHRAGM PUMPS	1	
INSTALL DATE	January 2017	
APPLICATION	Heat trace/insulation on dehy units	
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation	
ROUTED TO PROCESS – Yes / No	No	
CONTROLLED - Yes / No	No	

Comments		

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  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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40 CFR Subpart OOOOa Compliance Plan – Production

#### Diaphragm Pumps

Spitfire LOCATION COUNTY Belmont (OH) 911 ADDRESS

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	/ELL	NAMES	1H /	3
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NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	January 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	January 2017
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No No
CONTROLLED – Yes / No	No

Comments		

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  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard Profire 2100 BMS.
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40 CFR Subpart OOOOa Compliance Plan – *Production* 

#### Diaphragm Pumps

LOCATION COUNTY

Taco Cat Belmont (OH) 911 ADDRESS

(b) (9)

WELL NAMES 1H/3H/5H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	May 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE -	May 2017
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments			

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40 CFR Subpart OOOOa Compliance Plan - Production

## Diaphragm Pumps

LOCATION

Thrasher

911 ADDRESS

(b) (9)

COUNTY

Belmont (OH)

WELL NAMES

1H / 3H / 5H

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	April 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	April 2016
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments				

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40 CFR Subpart OOOOa Compliance Plan - Production

#### Diaphragm Pumps

LOCATION COUNTY

Thunderstruck Belmont (OH)

911 ADDRESS

(b) (9

WELL NAMES 2H-A / 4H / 6H / 8H / 10H-A

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	July 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

NO. OF DIAPHRAGM PUMPS	1
INSTALL DATE	July 2016
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments			

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40 CFR Subpart OOOOa Compliance Plan - Production

#### Diaphragm Pumps

LOCATION COUNTY Tuna Nut Belmont (OH) 911 ADDRESS

(b) (9

WELL NAMES

1H / 3H / 5H / 7H

NO. OF DIAPHRAGM PUMPS	11	
INSTALLED ON	June 2017	
APPLICATION	Glycol transfer pump on storage tank	
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation	
ROUTED TO PROCESS – Yes / No	No	
CONTROLLED – Yes / No	No	
GREENFIELD SITE - Yes / No	No	

NO. OF DIAPHRAGM PUMPS	1
INSTÄLL DATE	June 2017
APPLICATION	Heat trace/insulation on dehy units
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No

Comments	

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# Rice Drilling D, LLC NSPS Subpart OOOOa Annual Report

# **Fugitive Components at Well Sites**

Well Site	Street Address	City	County	State	Monitoring Survey Records Included?
Big Dawg			Belmont	ОН	8/24/2017
Big Foot			Belmont	ОН	9/20/2017
Blue Thunder			Belmont	ОН	7/7/2017
Bounty Hunter			Belmont	ОН	8/23/2017
Dr Awkward			Belmont	ОН	8/22/2017
Oragons Breath			Belmont	ОН	8/30/2017
Haymaker			Belmont	ОН	8/16/2017
ron Warrior			Belmont	ОН	8/23/2017
lunkyard Dog			Belmont	ОН	8/24/2017
Madusa			Belmont	ОН	8/16/2017
Monster Mutt			Belmont	ОН	8/24/2017
Spitfire			Belmont	ОН	8/24/2017
Taco Cat			Belmont	ОН	8/16/2017
Thrasher			Belmont	ОН	8/23/2017
Thunderstruck			Belmont	ОН	8/22/2017
Tuna Nut			Belmont	ОН	8/22/2017

			1
	•		



# Rice Drilling D LLC LDAR Inspection Conducted on August 24, 2017 Big Dawg Well Pad 1HA, 3HA, 5H, 7H



l Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Big Dawg 1HA, 3HA, 5H, 7H Leaking Components Report

Inspection Conducted on 08/24/2017

Total Leaking Components	11
Total repairs not made within 30 days	0

Leak#	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
BIGD-20170824-001	7H Well Head Casing Transducer	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
BIGD-20170824-002	Fuel Skid 2 Phase Sight Glass	_ 0GI_	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
BIGD-20170824-003	7H GPU Run 1 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
BIGD-20170824-004	7H GPU Run 1 Supply Line 90	OGI	FLIR GF 320	8/24/2017	9/23/2017	9/1/2017	1st Retaped	9/1/2017	YES
BIGD-20170824-005	7H GPU Run 2 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Replaced	8/24/2017	YES
BIGD-20170824-006	7H GPU Run 2 ESD Diaphragm	_ OGI_	FLIR GF 320	8/24/2017	9/23/2017	9/1/2017	1st Replaced	9/1/2017	YES
BIGD-20170824-007	7H GPU Run 2 Union	OGI	FLIR GF 320	8/24/2017	9/23/2017	9/1/2017	1st Retaped	9/1/2017	YES
BIGD-20170824-008	3HA GPU Run 2 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	9/1/2017	1st Replaced	9/1/2017	YES
BIGD-20170824-009	3HA GPU Run 1 Union	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
BIGD-20170824-010	1HA GPU Run 2 ESD Diaphragm	OGI	FLIR GF 320	8/24/2017	9/23/2017	9/1/2017	1st Replaced	9/1/2017	YES
BIGD-20170824-011	1HA GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753



WELLPAD	Big Dawg we	ellpad				
ON-SITE CONTACT	Justin Stogner	· · · · -				_
DATE TESTED	8/24/2017	STAR	T TIME	0800	END TIME	1130
SKY CONDITIONS	Clear	AMBIE	ENT TEMP	77	WIND SPEED	3
CAMERA MODEL			FLIR GF 32	20		
CAMERA ID NUMBE		S/N: 44401600				
CAMERA CERTIFICA	ATION DATE		8 August 2	016		
DAILY VERIFICATION	N DATE		8/24/2017			
MAXIMUM VIEWING	DISTANCE		25 feet		,,	
MONITORING COMP	PANY		Premier En	ergy Services	s, LLC	
MONITORING TECH	NICIAN		(b) (6)			
TECHNICIAN CERTI	FIED? (Y/N)		YES			
TECHNICIAN YEARS	OF EYPERIE	NCE	2 Months			

	LEAKS DETECTED (Attach additional sheets if necessary)								
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt				
1	7H Well Head casing Transducer	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
2	Fuel Skid 2 Phase Sight Glass	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
3	7H GPU Run 1 High- Low Quick Exhaust	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
4	7H GPU Run 1 Supply Line 90	8/24/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped				
5	7H GPU Run 2 High- Low Quick Exhaust	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced				
6	7H GPU Run 2 ESD Diaphragm	8/24/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced				

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	5
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( </td <td>~</td>	~
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (/)	<b>✓</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (V)	<del></del>
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A
*If either plan or path were not followed, please include a written description and explanation	on with this form.

#### **ADDITIONAL OHIO CALCULATION:**

 $Leak\% = \frac{e^{ak} \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	11
ESTIMATED COMPONENT COUNT*	1073
LEAK PERCENT**	1.0

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

\_Date: <u>24 Augus 20</u>17

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.



	LEAKS DETECTED (Attach additional sheets if necessary)								
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt				
7	7H GPU Run 2 Union	8/24/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped				
8	3HA GPU Run 2 High- Low Quick Exhaust	8/24/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced				
9	3HA GPU Run 1 Union	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
10	1HA GPU Run 2 ESD Diaphragm	8/24/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced				
11	IHA GPU Run 2 Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				

#### Initial Site Photo

Location: Well Head

Date & Time: 8/24/2017 8:30:40 AM

Geolocation: N(b) (9)



#### Camera Verification Photo

Location: GPU Stack

Date & Time: 8/24/2017 8:32:05 AM



#### BIGD-20170824-001IR Leaking

Location: 7H Well Head Casing Transducer

Date & Time: 8/24/2017 8:44:13 AM

Geolocation: (b) (9)

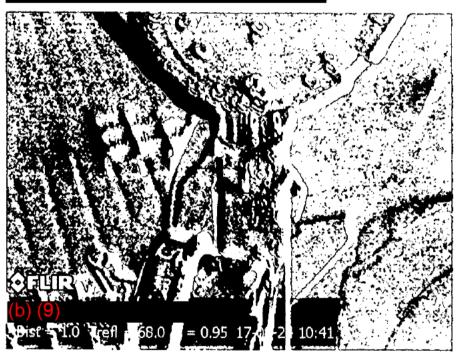
(b) (9)



#### BIGD-20170824-001IR Repaired

Location: 7H Well Head Casing Transducer

Date & Time: 8/24/2017 10:41:48 AM

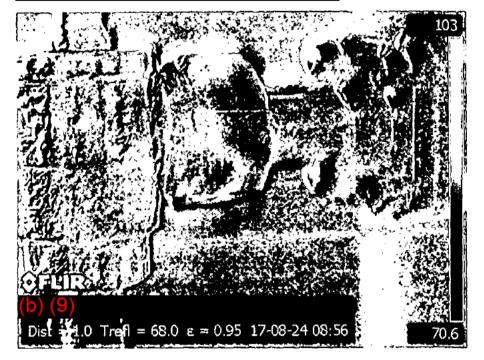


#### BIGD-20170824-002IR Leaking

Location: Fuel Skid 2 Phase Sight Glass

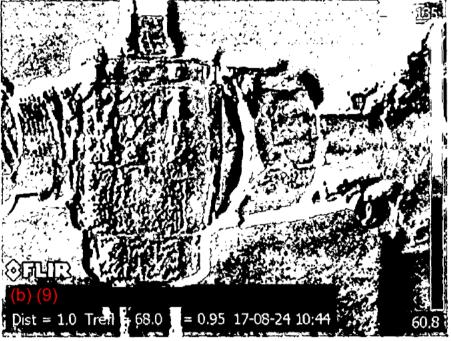
Date & Time: 8/24/2017 8:56:28 AM

Geolocation: (b) (9)



#### BIGD-20170824-002IR Repaired

Location: Fuel Skid 2 Phase Sight Glass Date & Time: 8/24/2017 10:44:59 AM

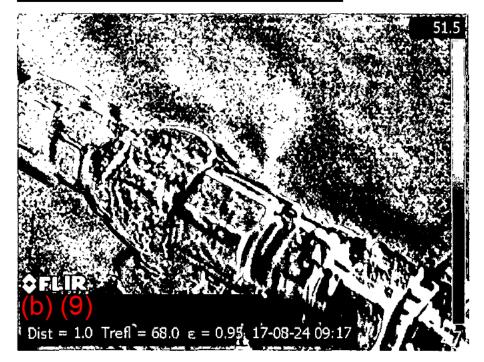


#### BIGD-20170824-003IR Leaking

Location: 7H GPU Run 1 High- Low Quick Exhaust

Date & Time: 8/24/2017 9:17:18 AM

Geolocation: (b) (9)



#### BIGD-20170824-003IR Repaired

Location: 7H GPU Run 1 High- Low Quick Exhaust

Date & Time: 8/24/2017 10:47:09 AM



# BIGD-20170824-004IR Leaking

Location: 7H GPU Run 1 Supply Line 90
Date & Time: 8/24/2017 9:24:18 AM

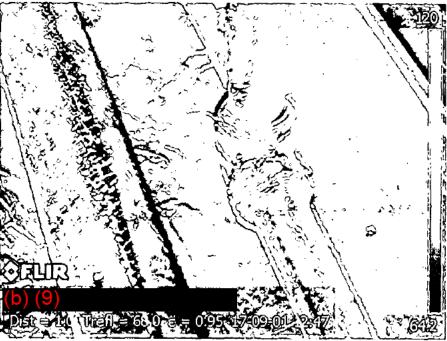
Geolocation: (b) (9)



### BIGD-20170824-004IR Repaired

7H GPU Run 1 Supply Line 90 Location:

Date & Time: 9/1/2017 12:47:16 PM

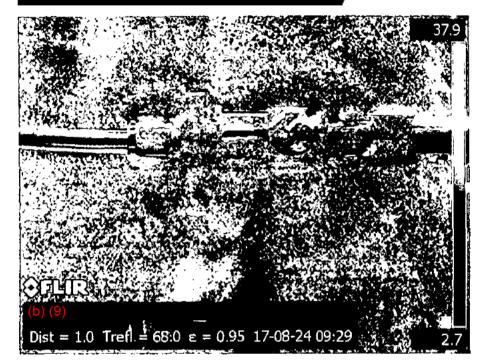


#### BIGD-20170824-005IR Leaking

Location: 7H GPU Run 2 High- Low Quick Exhaust

Date & Time: 8/24/2017 9:29:22 AM

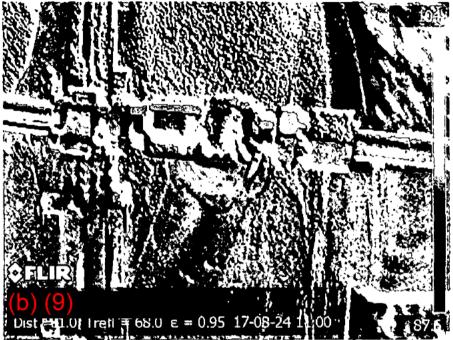
Geolocation: (b) (9)



#### BIGD-20170824-005IR Repaired

Location: 7H GPU Run 2 High- Low Quick Exhaust

Date & Time: 8/24/2017 11:00:24 AM



#### BIGD-20170824-006IR Leaking

7H GPU Run 2 ESD Diaphragm Location:

Date & Time: 8/24/2017 9:35:29 AM Geolocation: N(b) (9)



#### BIGD-20170824-006IR Repaired

7H GPU Run 2 ESD Diaphragm Location:

Date & Time: 9/1/2017 12:50:23 PM Geolocation: (b) (9)



#### BIGD-20170824-007IR Leaking

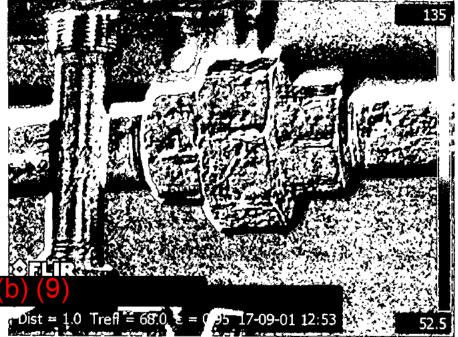
Location: 7H GPU Run 2 Union
Date & Time: 8/24/2017 9:49:09 AM

Geolocation: (b) (9)



#### BIGD-20170824-007IR Repaired

Location: 7H GPU Run 2 Union Date & Time: 9/1/2017 12:53:07 PM

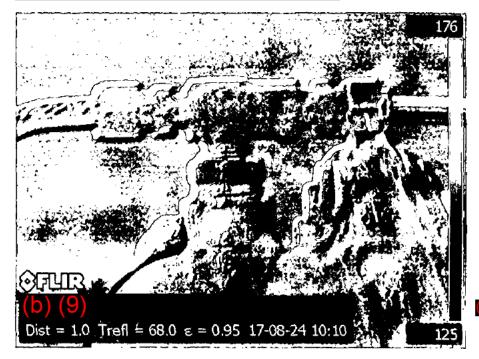


#### BIGD-20170824-008IR Leaking

Location: 3HA GPU Run 2 High- Low Quick Exhaust

Date & Time: 8/24/2017 10:10:12 AM

Geolocation: (b) (9)



#### BIGD-20170824-008IR Repaired

Location: 3HA GPU Run 2 High- Low Quick Exhaust

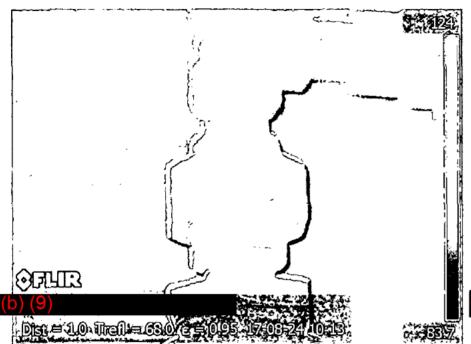
Date & Time: 9/1/2017 1:26:58 PM



# BIGD-20170824-009IR Leaking

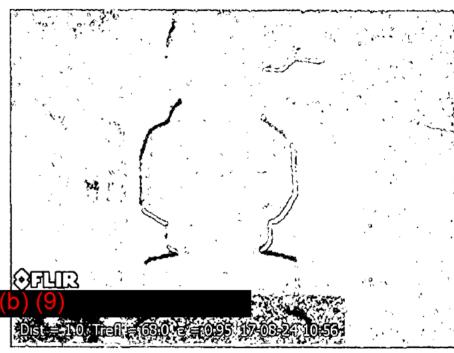
3HA GPU Run 1 Union Location: Date & Time: 8/24/2017 10:13:47 AM

Geolocation: (b) (9)



# BIGD-20170824-009IR Repaired Location: 3HA GPU Run 1 Union

Date & Time: 8/24/2017 10:56:27 AM



#### BIGD-20170824-010IR Leaking

1HA GPU Run 2 ESD Diaphragm Location:

Date & Time: 8/24/2017 10:26:43 AM

Geolocation: (b) (9)



#### BIGD-20170824-010IR Repaired

Location: 1HA GPU Run 2 ESD Diaphragm

Date & Time: 9/1/2017 12:59:07 PM
Geolocation: (b) (9)

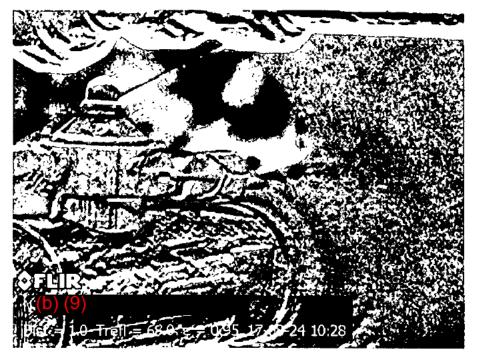


#### BIGD-20170824-011IR Leaking

Location: 1HA GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 10:28:11 AM

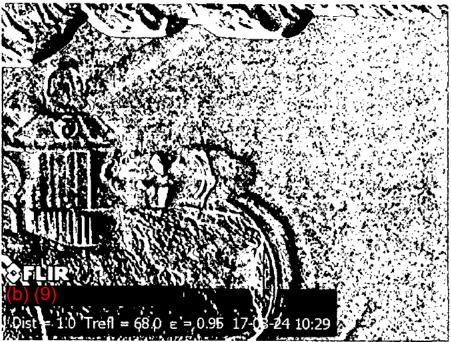
Geolocation: (b) (9)



#### BIGD-20170824-011IR Repaired

Location: 1HA GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 10:29:42 AM



# **LDAR FLIR Monitoring Form - Production**



WELLPAD	Bigfoot							
ON-SITE CONTACT	Adam Malle	Adam Mailett						
DATE TESTED	9/20/17	START TIME	11:25	END TIME	13:00			
SKY CONDITIONS	Cloudy	AMBIENT TEMP	71°	WIND SPEED	5 mph			

CAMERA MODEL	GFx320	
CAMERA ID NUMBER	SN 74900102	
CAMERA CERTIFICATION DATE	2/27/2017	
DAILY VERIFICATION DATE	9/20/17	
MAXIMUM VIEWING DISTANCE	25 feet	

MONITORING COMPANY	Rice Energy
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	Υ
TECHNICIAN YEARS OF EXPERIENCE	1.5 years

	LEAKS DETECTED (Attach additional sheets if necessary)					
Lo	cation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt	
1	Dehy Motor Valve Stainless Fitting	9/20/17	9/20/17	GFx320 74900102	Tightened fitting	
2	4H Run 1 Fuel Supply Stainless Fitting	9/20/17	9/20/17	GFx320 74900102	Tightened fitting	
3	6H Run 1 Regulator Stainless fitting	9/20/17	9/20/17	GFx320 74900102	Tightened fitting	
4		<u> </u>				
5						
6						

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (~)	N/A
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	. 0

### **LDAR FLIR Monitoring Form - Production**



NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0
AT LEAST ONE STILL IMAGE IS ATTACHED (*)	<b>/</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (✓)	<b>✓</b>
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	<b>~</b>
REPAIR STILL IMAGES ARE ATTACHED (✓ or N/A)	4
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	4
DELAY OF REPAIR FORMS COMPLETE (✓ or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### **ADDITIONAL OHIO CALCULATION:**

$$Leak\% = \frac{Count_{Leak}}{Count_{Est}} \times 100\%$$

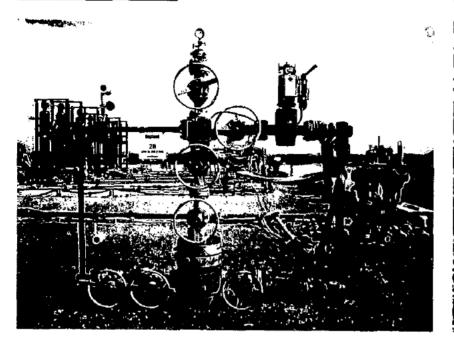
LEAKER COUNT	3
ESTIMATED COMPONENT COUNT*	1591
LEAK PERCENT**	0.19%

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature: (b) (6) Date: 9/21/17

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

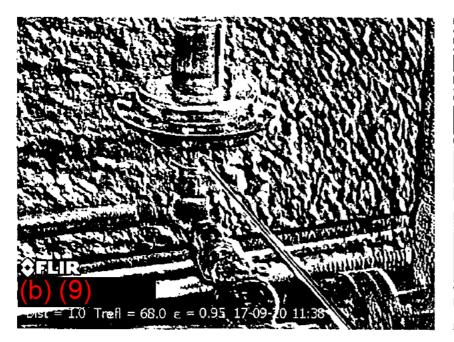
# **Initial Site Photo**



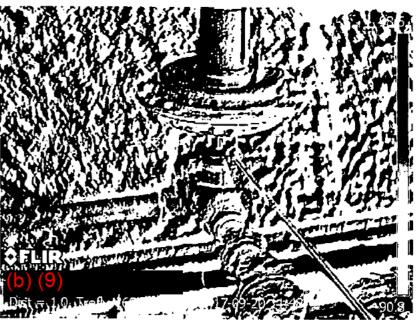
# Camera Verification Photo



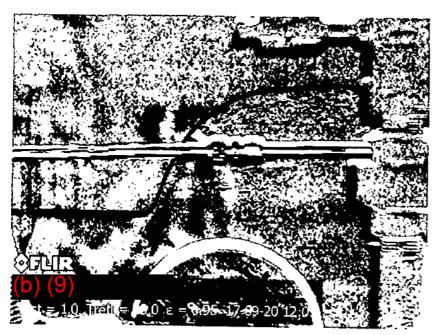
# **Dehy Motor Valve Stainless Fitting Leak**



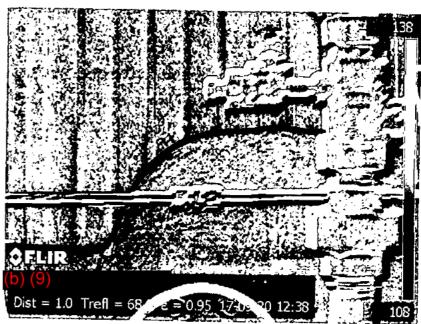
# **Dehy Motor Valve Stainless Fitting Repair**



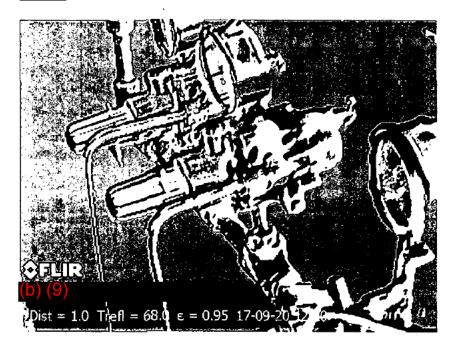
# 4H Run 1 Fuel Supply Stainless Fitting Leak



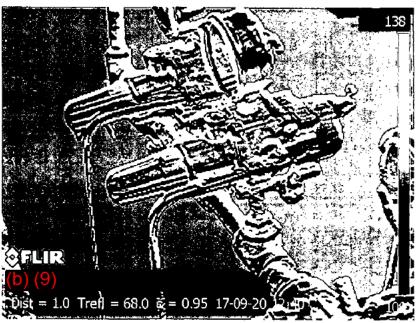
4H Run 1 Fuel Supply Stainless Fitting Repair



#### 6H Run 1 Fuel Supply Stainless Fitting Leak



6H Run 1 Fuel Supply Stainless Fitting Repair



#### **LDAR Form**



WELLPAD	Blue Thunder Wellpad	
DATE TESTE	D July 7 and July 21, 2016	
ON-SITE CONTACT		Frank King

LEAK DETECTION EQUIPMENT	GasFindIR HSX	TESTING COMPANY	Environmental Resources Management (ERM)
MANUFACTURER CERTIFICATION DATE	7/29/2015	TESTING COMPLETED BY	(b) (6)
DAILY VERIFICATION DATE	7/7/16 and 7/21/16	TECHNICIAN CERTIFICATION DATE	2/12/2015

	Location Description	Date Detected	Date Repaired	Corrective Action Description
1	12H – run 1: Stainless fitting above burner.	7/7/16	7/7/16	Tightened fitting.
2	Stainless fitting.	7/7/16	7/7/16	Tightened fitting.
3	10H – run 2: Weep holes around Hi-Lo.	7/7/16	7/21/16	Diaphragm was replaced
4				
5				

LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	·
REPAIR STILL IMAGES ARE ATTACHED (✓ or N/A)	1
DELAY OF REPAIR FORMS COMPLETE (✓ or N/A)	N/A

<u>For Ohio wellpads</u>, complete following calculation. If Leak Percent is greater than 2.0%, reduce monitoring frequency to quarterly.

Leak% =	$\frac{\textit{Count}_{\textit{Leak}}}{\textit{Count}_{\textit{Est}}}$	X	100%
---------	--	---	------

Leaker Count	3	
Estimated Component Count	464	
(from Emissions Permitting Specialist)	1 404	
Leak Percent	0.65%	

Signature:



Date: <u>7/28/2016</u>



#### Leak Detection and Repair Photolog

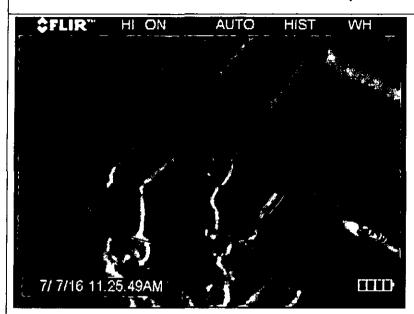


Photo 1: 12H – run 1: Stainless fitting above burner leak.

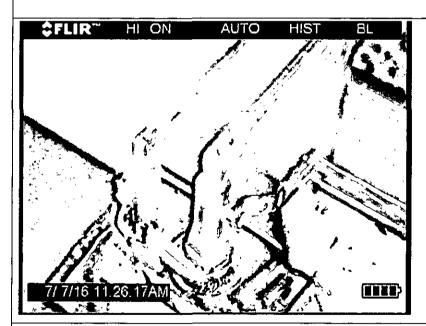


Photo 2: 12H – run 1: Stainless fitting above burner repair.

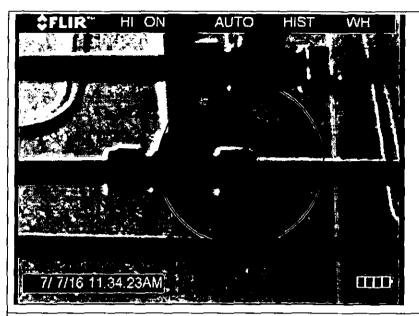


Photo 3: Stainless fitting leak.

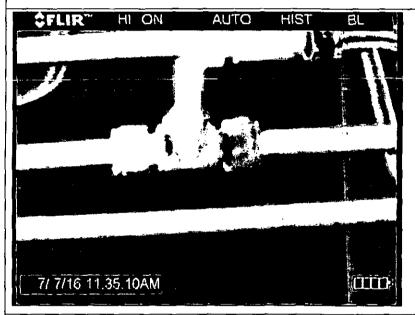


Photo 4: Stainless fitting repair.



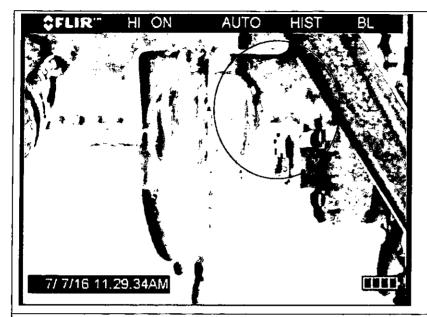


Photo 5:

10H - run 2: Weep hole leaks around Hi-Lo.

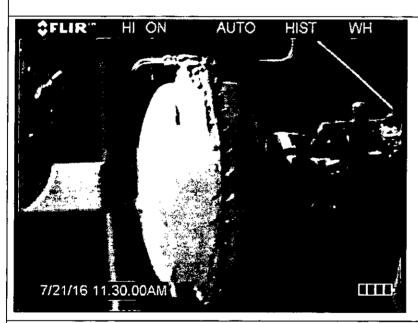


Photo 6:

10H - run 2: Hi-Lo repair.



# Rice Drilling D LLC LDAR Inspection Conducted on August 23, 2017 Bounty Hunter Well Pad 2H, 4H, 6H, 8H



l Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Bounty Hunter 2H, 4H, 6H, 8H Leaking Components Report

Inspection Conducted on 08/23/2017

Total Leaking Components	2
Total repairs not made within 30 days	0

		Testing	Testing	Inspection	Final Repair		Corrective Action		Repair confirmed
Leak#	Location Description	Method	Equipment	Date	Deadline	Repair Date	Description	OGI Retest Date	with OGI?
BOUN-20170823-001	TEG Fuel Gas Union	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES
BOUN-20170823-002	2H GPU Run 2 Fuel Gas Union	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753

**TECHNICIAN YEARS OF EXPERIENCE** 



				7		
WELLPAD	Bounty Hunte	er wellpad				
ON-SITE CONTACT						
DATE TESTED	8/23/2017	START TIME	0745	END TIME	1030	
SKY CONDITIONS	Cloudy	AMBIENT TEMP	64	WIND SPEED	8mph	
CAMERA MODEL		FLIR GF 3	20			
CAMERA ID NUMBE	R	S/N: 44401	S/N: 44401600			
CAMERA CERTIFICA	ATION DATE	8 August 2	8 August 2016			
DAILY VERIFICATIO	N DATE	8/23/2017	8/23/2017			
MAXIMUM VIEWING	DISTANCE	25 feet	25 feet			
MONITORING COMP	ANY	Premier En	Premier Energy Services, LLC			
MONITORING TECHI	NICIAN	(b) (6)	(b) (6)			
TECHNICIAN CERTIF	FIED? (Y/N)	YES	YES			

	LEAKS DETECTED (Attach additional sheets if necessary)				
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1	TEG Fuel Gas Union	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
2	2H GPU Run 2 Fuel Gas Union	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 st Tightened
3					
4	ļ				
5					
6					

2 Months

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (V)	<b>√</b>
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (✓)	<b>V</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1/2)	<b>/</b>
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	<u> </u>
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	<b>✓</b>
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

 $\frac{\textit{ADDITIONAL OHIO CALCULATION:}}{\textit{Leak}\%} = \frac{t_{\textit{Leak}} \times 100\%}{\textit{Count}_{\textit{Est}}}$ 

LEAKER COUNT	2
ESTIMATED COMPONENT COUNT*	1437
LEAK PERCENT**	.14

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

\_\_\_Date: 23 August 2017

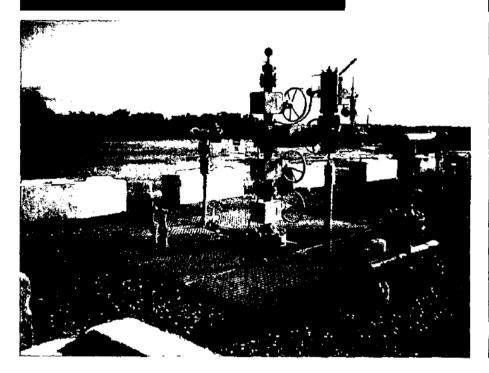
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

#### Initial Site Photo

Well Head Location:

Date & Time: 8/23/2017 8:46:45 AM

Geolocation: (b) (9)



#### Camera Verification Photo

Location: Dehy Stack
Date & Time: 8/23/2017 8:52:23 AM



#### BOUN-20170823-001IR Leaking

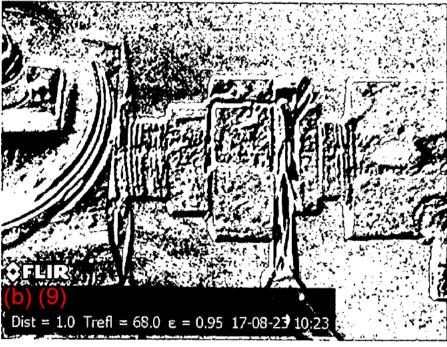
Location: TEG Fuel Gas Union
Date & Time: 8/23/2017 8:57:38 AM

Geolocation: (b) (9)



#### BOUN-20170823-001IR Repaired

Location: TEG Fuel Gas Union
Date & Time: 8/23/2017 10:24:02 AM



# BOUN-20170823-002IR Leaking

Location: 2H GPU Run 2 Fuel Gas Union

Date & Time: 8/23/2017 10:01:09 AM

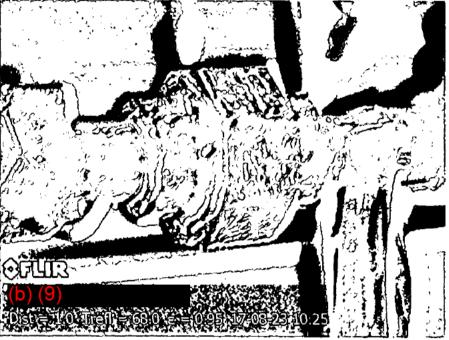
Geolocation: (b) (9)



### BOUN-20170823-002IR Repaired

Location: 2H GPU Run 2 Fuel Gas Union

Date & Time: 8/23/2017 10:25:27 AM





# Rice Drilling D LLC LDAR Inspection Conducted on August 22, 2017 Dr Awkward Well Pad 1H, 3H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Dr Awkward 1H, 3H Leaking Components Report

Inspection Conducted on 08/22/2017

Total Leaking Components		10
Total repairs not made withi	in 30 days	0

Leak#	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
DRAW-20170822-001	1H GPU Run 2 High- Low Valve	OGI	FLIR GF 320	8/22/2017	9/21/2017	9/1/2017	1st Replaced	9/1/2017	YES
DRAW-20170822-002	1H GPU Run 1 High- Low Valve	OGI	FLIR GF 320	8/22/2017	9/21/2017	9/1/2017	1st Replaced	9/1/2017	YES
DRAW-20170822-003	1H GPU Run 2 Fuel Supply Union	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
DRAW-20170822-004	1H GPU Run 1 Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
DRAW-20170822-005	1H GPU Run 1 Main Gas Supply Line	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
DRAW-20170822-006	1H GPU Run 1 Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
DRAW-20170822-007	3H GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YEŞ
DRAW-20170822-008	3H GPU Run 2 Pilot Gas	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
DRAW-20170822-009	3H GPU Run 1 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
DRAW-20170822-010	3H GPU Run 1 Fuel Supply to Shutdown	OGI	FLIR GF 320	8/22/2017	9/21/2017	9/1/2017	1st Retaped	9/1/2017	YES

Inspection Personnel	OGI Certification Number		
(b) (6)	163753		



WELLPAD	Dr Awkward wellpad					
ON-SITE CONTACT	Jed Marshall					
DATE TESTED	8/22/2017	START TIME	0725	END TIME	1030	
SKY CONDITIONS	Clear	AMBIENT TEMP	70	WIND SPEED	6	

CAMERA MODEL	FLIR GF 320		
CAMERA ID NUMBER	S/N: 44401600		
CAMERA CERTIFICATION DATE	8 August 2016		
DAILY VERIFICATION DATE	8/22/2017		
MAXIMUM VIEWING DISTANCE	25 feet		

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

LEAKS DETECTED (Attach additional sheets if necessary)						
Lo	ocation Description	tion Description Date Detected Repaired			Corrective Action Description For Each Attempt	
1	1H GPU Run 2 High- Low Valve	8/22/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced	
2	IH GPU Run I High- Low Valve	8/22/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced	
3	1H GPU Run 2 Fuel Supply Union	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened	
4	IH GPU Run 1 Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened	
5	IH GPU Run 1 Main Gas Supply Line	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened	
6	1H GPU Run 1 Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened	

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	3
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( )	<b>√</b>
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (<)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (*)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	7
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	<b>√</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (*)	<b>✓</b>
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{e^{ak} \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	10
ESTIMATED COMPONENT COUNT*	624
LEAK PERCENT**	1.6

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature (b) (6) Date: 22 Avgvst 2017

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.



	LEAKS DETECTED (Attach additional sheets if necessary)						
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt		
7	3H GPU Run 2 Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
8	3H GPU Run 2 Pilot Gas	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
9	3H GPU Run 1 Fuel Gas Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
10	3H GPU Run 1 Fuel Supply to Shutdown	8/22/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped		

### Initial Site Photo

Location: Well Head

Date & Time: 8/22/2017 8:29:11 AM

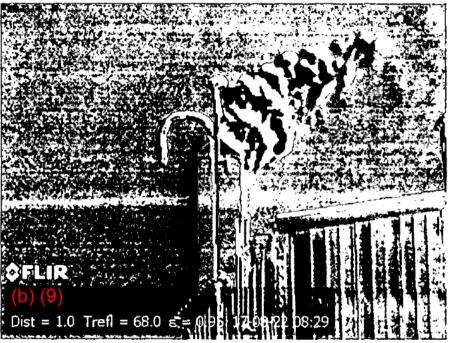
Geolocation: (b) (9)



### Camera Verification Photo

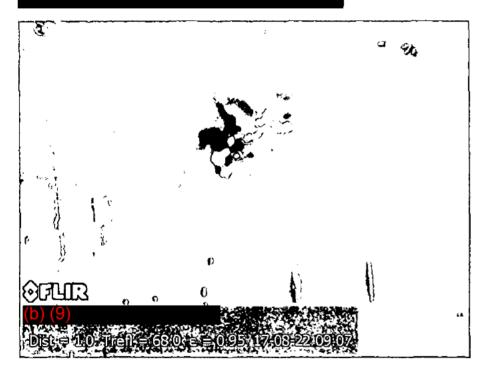
Location: GPU Stack

Date & Time: 8/22/2017 8:29:53 AM



## DRAW-20170822-001IR Leaking

Location: 1H GPU Run 2 High- Low Valve
Date & Time: 8/22/2017 9:08:01 AM
Geolocation: (b) (9)



# DRAW-20170822-001IR Repaired

Location: 1H GPU Run 2 High- Low Valve
Date & Time: 9/1/2017 9:01:54 AM
Geolocation: (b) (9)



## DRAW-20170822-002IR Leaking

Location: 1H GPU Run 1 High- Low Valve Date & Time: 8/22/2017 9:08:54 AM

Geolocation: (b)



## DRAW-20170822-002IR Repaired

Location: 1H GPU Run 1 High- Low Valve
Date & Time: 9/1/2017 9:08:20 AM



## DRAW-20170822-003IR Leaking

Location: 1H GPU Run 2 Fuel Supply Union

Date & Time: 8/22/2017 9:09:36 AM

Geolocation: (b) (9)



## DRAW-20170822-003IR Repaired

Location: 1H GPU Run 2 Fuel Supply Union

Date & Time: 8/22/2017 9:17:00 AM



## DRAW-20170822-004IR Leaking

Location: 1H GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 9:10:28 AM

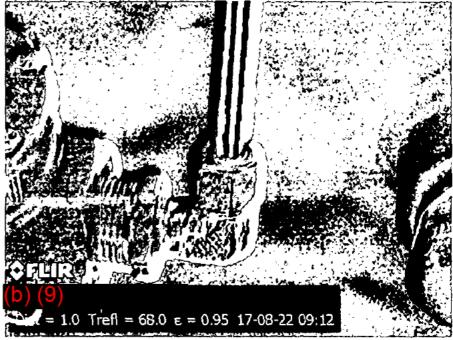
Geolocation: (b) (9)



## DRAW-20170822-004IR Repaired

Location: 1H GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 9:12:56 AM



# DRAW-20170822-005IR Leaking

Location: IH GPU Run 1 Main Gas Supply Line

Date & Time: 8/22/2017 9:27:55 AM

Geolocation: (b) (9)



### DRAW-20170822-005IR Repaired

Location: 1H GPU Run 1 Main Gas Supply Line

Date & Time: 8/22/2017 9:14:35 AM



### DRAW-20170822-006IR Leaking

Location: 1H GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 9:15:07 AM

Geolocation: (b) (9)



## DRAW-20170822-006IR Repaired

Location: 1H GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 9:28:31 AM



## DRAW-20170822-007IR Leaking

Location: 3H GPU Run 2 Stainless Fitting

Date & Time: 8/22/2017 9:38:53 AM

Geolocation: (b) (9)

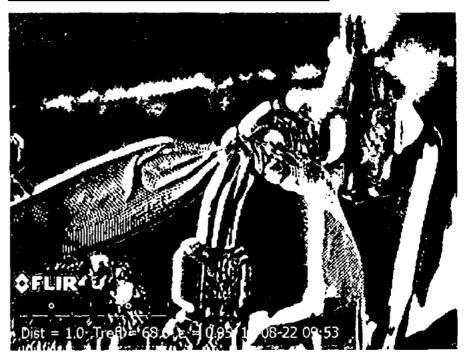
(b) (9)



## DRAW-20170822-007IR Repaired

Location: 3H GPU Run 2 Stainless Fitting

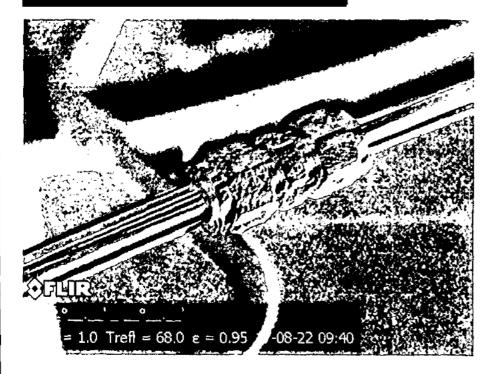
Date & Time: 8/22/2017 9:53:53 AM



## DRAW-20170822-008IR Leaking

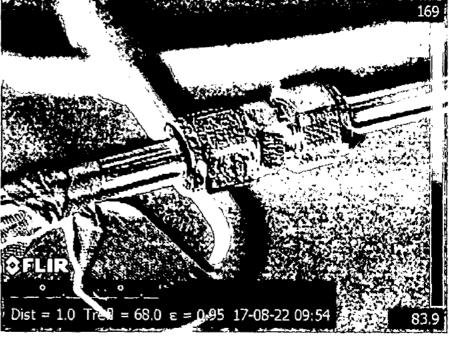
Location: 3H GPU Run 2 Pilot Gas Date & Time: 8/22/2017 9:40:26 AM

Geolocation: (b) (9)



# DRAW-20170822-008IR Repaired

Location: 3H GPU Run 2 Pilot Gas Date & Time: 8/22/2017 9:55:00 AM

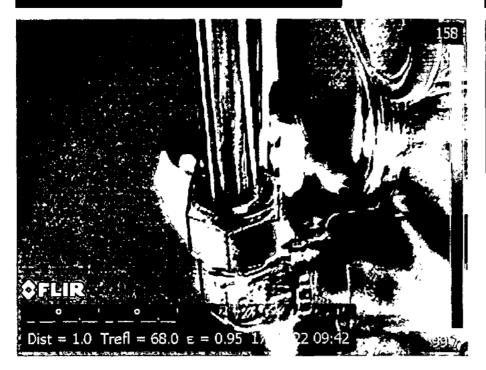


## DRAW-20170822-009IR Leaking

Location: 3H GPU Run 1 Fuel Gas Stainless Fitting

Date & Time: 8/22/2017 9:42:19 AM

Geolocation: (b) (9)



## DRAW-20170822-009IR Repaired

Location: 3H GPU Run 1 Fuel Gas Stainless Fitting

Date & Time: 8/22/2017 9:56:40 AM



## DRAW-20170822-010IR Leaking

3H GPU Run 1 Fuel Supply to Shutdown Location:

Date & Time: 8/22/2017 9:44:37 AM Geolocation: (b) (9)



## DRAW-20170822-010IR Repaired

3H GPU Run 1 Fuel Supply to Shutdown Location:

Date & Time: 9/1/2017 9:06:07 AM





# Rice Drilling D LLC

LDAR Inspection Conducted on August 30, 2017 Dragons Breath Well Pad 1H, 3H, 5H, 7H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Dragons Breath 1H, 3H, 5H, 7H Leaking Components Report

Inspection Conducted on 08/30/2017

Total Leaking Components	8
Total repairs not made within 30 days	0

Leak#	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
DRAG-20170830-001	7H GPU Run 2 High- Low Grease Fitting	OGI	FLIR GF 320	8/30/2017	9/29/2017	9/30/2017	1st Tightened	8/30/2017	YES
DRAG-20170830-002	7H GPU Run 1 Low Level Switch Stainless Fitting	OGI	FLIR GF 320	8/30/2017	9/29/2017	3/30/2017	1st Tightened	8/30/2017	YES.
DRAG-20170830-003	7H GPU Run 1 Low Level Switch Stainless Fitting	OGI	FLIR GF 320	8/30/2017	9/29/2017	9/1/2017	1st Replaced	9/1/2017	YES
DRAG-20170830-004	5H GPU Run 1 Low Level Switch Stainless Fitting	ogi	FLIR GF 320	8/30/2017	9/29/2017	9/1/2017	1st Retaped 2nd Tightened	9/1/2017	YES
DRAG-20170830-005	5H GPU Run 2 Stainless Fitting	OGI_	FLIR GF 320	8/30/2017	9/29/2017	8/30/2017	1st Tightened	8/30/2017	YES
DRAG-20170830-006	3H GPU Run 2 Union	OGI	FLIR GF 320	8/30/2017	9/29/2017	8/30/2017	1st Tightened	8/30/2017	YES
DRAG-20170830-007	3H GPU Run 1 Stainless Fitting	OGI	FLIR GF 320	8/30/2017	9/29/2017	8/30/2017	1st Tightened	8/30/2017	YES
DRAG-20170830-008	Dehy I Thermal well Gauge	OGI	FLIR GF 320	8/30/2017	9/29/2017	9/1/2017	1st Replaced	9/1/2017	YES

Inspection Personnel	OGI Certification Number				
(b) (6)	163753				



WELLPAD Dragons Breath									
ON-SITE CONTACT	Jed Marshall								
DATE TESTED	8/30/2017	START TIME	0730	END TIME	1130				
SKY CONDITIONS	Cloudy	AMBIENT TEMP	59	WIND SPEED	1				

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/30/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

	LEAKS DETECTED (Attach additional sheets if necessary)								
Lo	ocation Description	Date Date Detected Repaired		Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt				
1	7H GPU Run 2 High- Low Grease Fitting	8/30/2017	8/30/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
2	7H GPU Run 1 Low Level Switch Stainless Fitting	8/30/2017	8/30/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
3	7H GPU Run 1 Low Level Switch Stainless Fitting	8/30/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped 2 <sup>nd</sup> Tightened				
4	5H GPU Run 1 Low Level Switch Stainless Fitting	8/30/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped				
5	5H GPU Run 2 Stainless Fitting	8/30/2017	8/30/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
6	3H GPU Run 2 Union	8/30/2017	8/30/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	3
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( )	1
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (✓)	<b>√</b> .
ALL STILL IMAGES ARE DATED AND GIS ENABLED (✓)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	7
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	7
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	<b>-</b>
DELAY OF REPAIR FORMS COMPLETE (✓ or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{^{eak} \times 100\%}{Count_{Est}}$$

LEAKER COUNT	8
ESTIMATED COMPONENT COUNT*	1519
LEAK PERCENT**	.52

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

\*\* If Leak Percent is greater than 10% increase monitoring frequency to quarterly.

(b) (6)
Signature

Date: 9/1/17



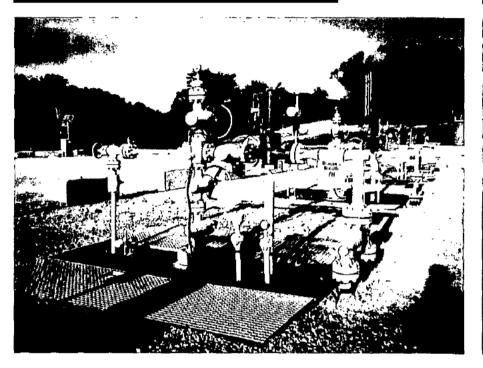
LEAKS DETECTED (Attach additional sheets if necessary)									
Location Description		Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt				
7	3H GPU Run 1	8/30/2017	8/30/2017	FLIR GF 320	1 <sup>st</sup> Tightened				
_	Stainless Fitting			S/N: 44401600					
8	Dehy 1 Thermal well	8/30/2017	9/1/2017	FLIR GF 320	1st Retaped				
8	Gauge			S/N: 44401600	•				

#### **Initial Site Photo**

Well Head Location:

Date & Time: 8/30/2017 8:15:27 AM

Geolocation: (b) (9)



### Camera Verification Photo

Location: Dehy Stack
Date & Time: 8/30/2017 8:16:38 AM



## DRAG-20170830-001IR Leaking

Location: 7H GPU Run 2 High- Low Grease Fitting

Date & Time: 8/30/2017 8:20:38 AM

Geolocation: (b) (9)

(b) (9)



## DRAG-20170830-001IR Repaired

Location: 7H GPU Run 2 High- Low Grease Fitting

Date & Time: 8/30/2017 10:58:45 AM



### DRAG-20170830-002IR Leaking

Location: 7H GPU Run 1 Low Level Switch Stainless Fitting

Date & Time: 8/30/2017 8:30:27 AM

Geolocation: (b) (9)



## DRAG-20170830-002IR Repaired

Location: 7H GPU Run 1 Low Level Switch Stainless Fitting

Date & Time: 8/30/2017 11:00:20 AM

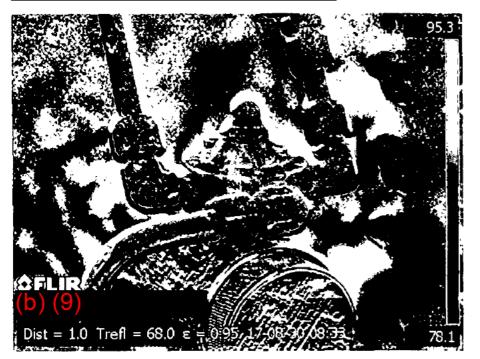


### DRAG-20170830-003IR Leaking

Location: 7H GPU Run 1 Low Level Switch Stainless Fitting

Date & Time: 8/30/2017 8:33:12 AM

Geolocation: (b) (9)



### DRAG-20170830-003IR Repaired

Location: 7H GPU Run 1 Low Level Switch Stainless Fitting

Date & Time: 9/1/2017 10:54:21 AM



### DRAG-20170830-004IR Leaking

Location: 5H GPU Run 1 Low Level Switch Stainless Fitting

Date & Time: 8/30/2017 8:40:22 AM

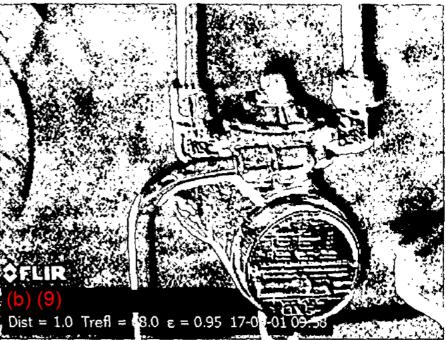
Geolocation: (b) (9)



# DRAG-20170830-004IR Repaired

Location: 5H GPU Run 1 Low Level Switch Stainless Fitting

Date & Time: 9/1/2017 9:58:58 AM

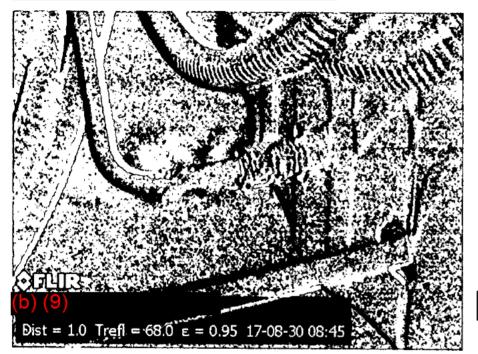


# DRAG-20170830-005IR Leaking

Location: 5H GPU Run 2 Stainless Fitting

Date & Time: 8/30/2017 8:45:38 AM

Geolocation: (b) (9)



## DRAG-20170830-005IR Repaired

Location: 5H GPU Run 2 Stainless Fitting

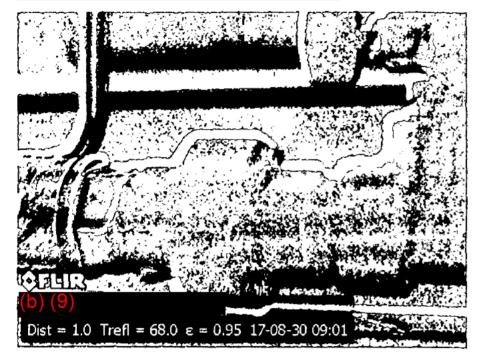
Date & Time: 8/30/2017 11:05:43 AM



## DRAG-20170830-006IR Leaking

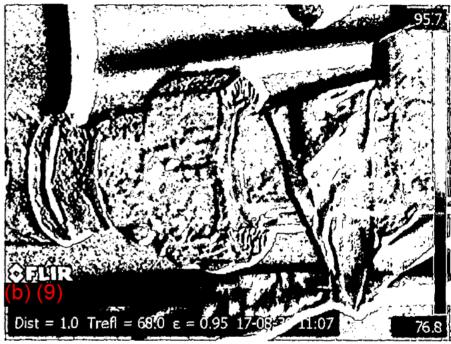
Location: 3H GPU Run 2 Union
Date & Time: 8/30/2017 9:01:08 AM

Geolocation: (b) (9)



## DRAG-20170830-006IR Repaired

Location: 3H GPU Run 2 Union
Date & Time: 8/30/2017 11:07:51 AM



### DRAG-20170830-007IR Leaking

Location: 3H GPU Run 1 Stainless Fitting

Date & Time: 8/30/2017 9:05:42 AM

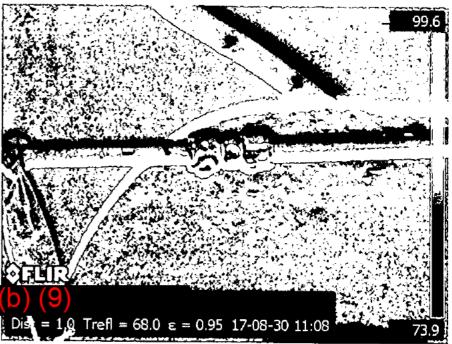
Geolocation: (b) (9)



# DRAG-20170830-007IR Repaired

Location: 3H GPU Run 1 Stainless Fitting

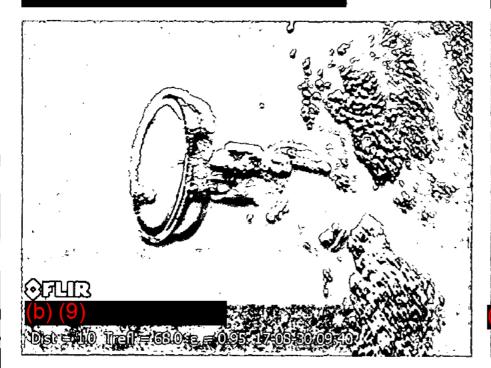
Date & Time: 8/30/2017 11:08:26 AM



## DRAG-20170830-008IR Leaking

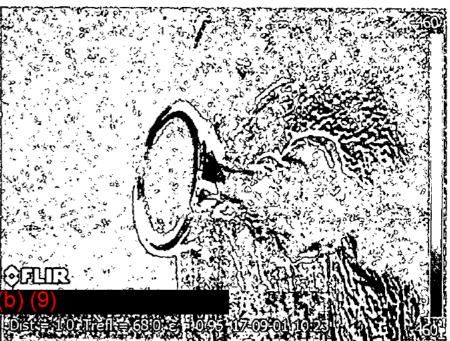
Location: Dehy t Thermal well Gauge
Date & Time: 8/30/2017 9:40:49 AM

Geolocation: (b) (9)



## DRAG-20170830-008IR Repaired

Location: Dehy 1 Thermal well Gauge
Date & Time: 9/1/2017 10:23:47 AM
Geolocation: (b) (9)





# Rice Drilling D, LLC LDAR Inspection Conducted on August 16, 2017 Haymaker Well Pad 1H, 3H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Haymaker 1H, 3H Leaking Components Report

Inspection Conducted on 08/16/2017

Total Leaking Components	5
Total repairs not made within 30 days	0

Leak#	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Carrective Action Description	OGJ Retest Date	Repair confirmed with OGI?
HAYM-20170816-001	3H GPU Run 2 High Low Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	l <sup>s</sup> Tightened	8/16/2017	YES
HAYM-20170816-002	3H GPU Run 2 Fuel Gas Union	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1 <sup>st</sup> Tightened	8/16/2017	YES
HAYM-20170816-003	311 GPU Run 1 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	E/16/2017	1* Tightened	8/16/2017	YES
HAYM-20170816-004	1H GPU Run 2 High Low Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1 <sup>st</sup> Tightened	8/16/2017	YES
HAYM-20170816-005	tH GPU Run 2 Fuel Gas Union	QGI	FLIR GF 320	8/16/2017	9/15/2017	E/16/2017	1* Tightened	8/16/2017	YES

Inspection Personnel	OGI Certification Number
(b) (9)	163753



WELLPAD	Haymaker Welipad				
ON-SITE CONTACT	Brandon St. Clair				
DATE TESTED	8/16/2017	START TIME	1230	END TIME	1400
SKY CONDITIONS	Clear	AMBIENT TEMP	81	WIND SPEED	3mph

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/16/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

LEAKS DETECTED (Attach additional sheets if necessary)					
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt
1	3H GPU Run 2 High Low Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
2	3H GPU Run 2 Fuel Gas Union	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
3	3H GPU Run 1 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1st Tightened
4	1H GPU Run 2 High Low Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	l <sup>st</sup> Tightened
5	IH GPU Run 2 Fuel Gas Union	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( )	<b>*</b>
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (√)	1
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1)	7
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	7
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	7
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	7
DELAY OF REPAIR FORMS COMPLETE (✓ or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{t_{Leak}}{Count_{Eat}} \times 100\%$$

LEAKER COUNT	5
ESTIMATED COMPONENT COUNT*	624
LEAK PERCENT**	0.80 %

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature:_	b) (6)	Date: <u>16 August 2017</u>
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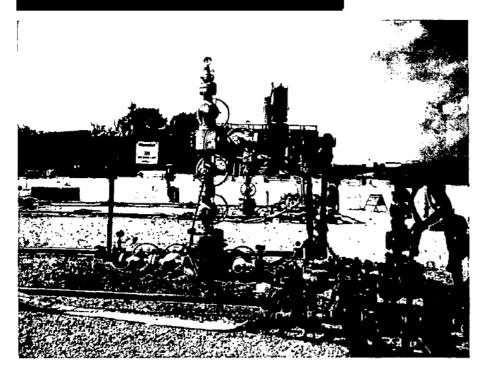
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

### Initial Site Photo

Location: Well Head

Date & Time: 8/16/2017 12:42:30 PM

Geolocation: (b) (9)



### Camera Verification Photo

Location: GPU Stack

Date & Time: 8/16/2017 12:50:07 PM

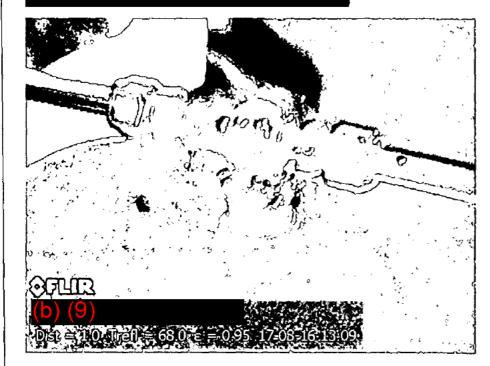


## HAYM-20180816-001IR Leaking

3H GPU Run 2 High Low Stainless Fitting Location:

Date & Time: 8/16/2017 1:10:00 PM

Geolocation: (b) (9)



# HAYM-20180816-001IR Repaired

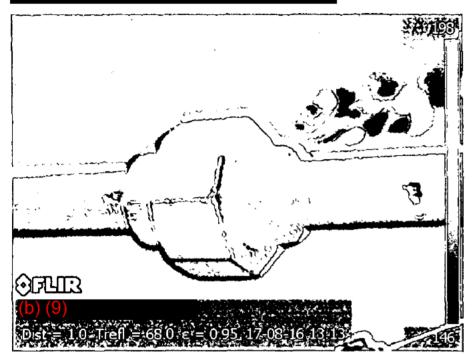
Location: 3H GPU Run 2 High Low Stainless Fitting
Date & Time: 8/16/2017 1:31:52 PM
Geolocation: (b) (9)



### HAYM-20180816-002IR Leaking

3H GPU Run 2 Fuel Gas Union Location:

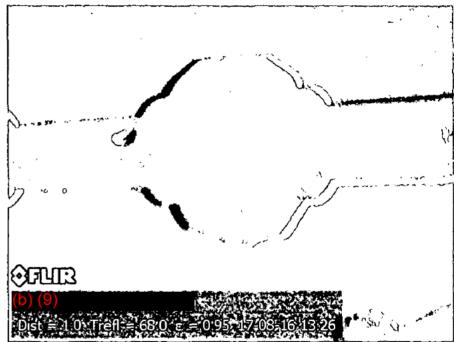
Date & Time: 8/16/2017 1:13:11 PM Geolocation: (b) (9)



### HAYM-20180816-002IR Repaired

3H GPU Run 2 Fuel Gas Union Location:

Date & Time: 8/16/2017 1:26:03 PM

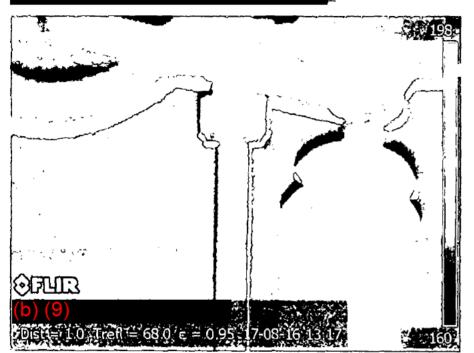


### HAYM-20180816-003IR Leaking

Location: 3H GPU Run 1 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 1:17:30 PM

Geolocation: (b) (9)



# HAYM-20180816-003IR Repaired

Location: 3H GPU Run 1 Fuel Gas Stainless Fitting

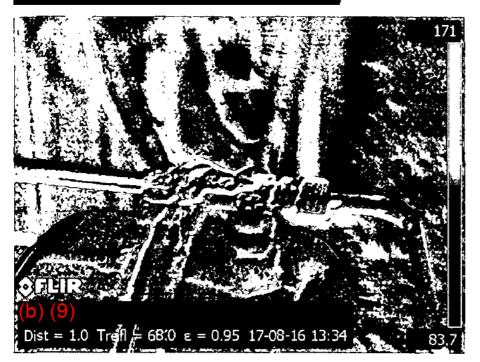
Date & Time: 8/16/2017 1:26:54 PM



### HAYM-20180816-004IR Leaking

1H GPU Run 2 High Low Stainless Fitting Location:

Date & Time: 8/16/2017 1:34:22 PM Geolocation: (b) (9)



### HAYM-20180816-004IR Repaired

Location: 1H GPU Run 2 High Low Stainless Fitting

Date & Time: 8/16/2017 1:41:59 PM



## HAYM-20180816-005IR Leaking

Location: 1H GPU Run 2 Fuel Gas Union

Date & Time: 8/16/2017 1:37:51 PM

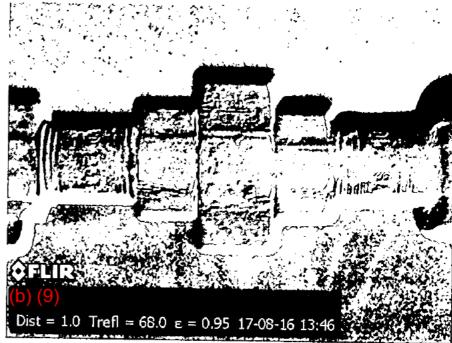
Geolocation: (b) (9)



## HAYM-20180816-005IR Repaired

Location: 1H GPU Run 2 Fuel Gas Union

Date & Time: 8/16/2017 1:46:20 PM





# Rice Drilling D, LLC

LDAR Inspection Conducted on August 23, 2017 Iron Warrior Well Pad 2H, 4H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Iron Warrior 2H, 4H Leaking Components Report

Inspection Conducted on 08/23/2017

Total Leaking Components	5	
Total repairs not made within 30 days	0	

Leak #	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
IRON-20170823-001	2H GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES
IRON-20170823-002	2H GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Replaced	8/23/2017	YES
IRON-20170823-003	2H GPU Run 2 Level Controller	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Replaced	8/23/2017	YES
RON-20170823-004	Dehy Stainless Fitting	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES
IRON-20170823-005	Fuel Skid Coalescent Filter Level Controller	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753

# LDAR FLIR Monitoring Form



WELLPAD	Iron Warrior wellpad							
ON-SITE CONTACT	Jed Marshall							
DATE TESTED	8/23/2017	START TIME	1045	END TIME	1250			
SKY CONDITIONS	Couldy	AMBIENT TEMP	70	WIND SPEED	8			

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/23/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

Location Description		n Description Date Detected		Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1	2H GPU Run 2 Stainless Fitting	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
2	2H GPU Run 2 Stainless Fitting	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	t <sup>st</sup> Replaced
3	2H GPU Run 2 Level Controller	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced
4	Dehy Stainless Fitting	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	I <sup>st</sup> Tightened
5	Fuel Skid Coalescent Filter Level Controller	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	I <sup>st</sup> Tightened
6					

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (✓)	7
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0

### **LDAR FLIR Monitoring Form**



AT LEAST ONE STILL IMAGE IS ATTACHED ( )	<b>√</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED ( </td <td>7</td>	7
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	<b>→</b>
REPAIR STILL IMAGES ARE ATTACHED (✓ or N/A)	<b>→</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* ( )	<b>√</b>
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

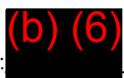
#### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{nt_{Leak}}{Count_{Est}} \times 100\%$$

LEAKER COUNT	5
ESTIMATED COMPONENT COUNT*	. 788
LEAK PERCENT**	.63

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature:



Date: 23 August 2017

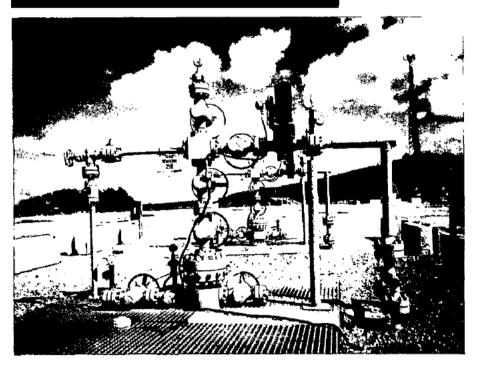
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

### Initial Site Photo

Location: Well Head

Date & Time: 8/23/2017 11:01:33 AM

Geolocation: (b) (9)



### Camera Verification Photo

Location: Dehy Stack

Date & Time: 8/23/2017 11:03:41 AM



### IRON-20170823-001IR Leaking

2H GPU Run 2 Stainless Fitting Location:

Date & Time: 8/23/2017 11:22:51 AM

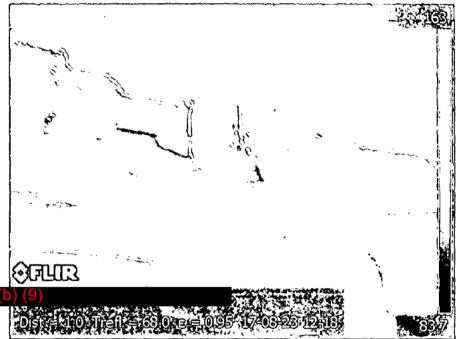
Geolocation: (b) (9)



### IRON-20170823-001IR Repaired

Location: 2H GPU Run 2 Stainless Fitting

Date & Time: 8/23/2017 12:19:00 PM Geolocation: (b) (9)



### IRON-20170823-002IR Leaking

2H GPU Run 2 Stainless Fitting Location:

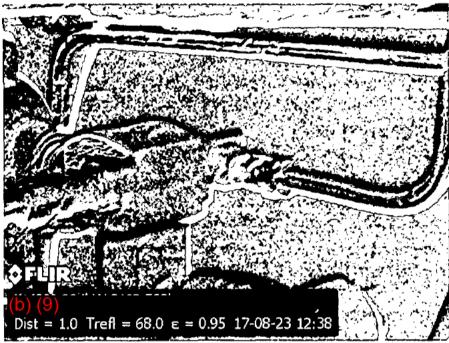
Date & Time: 8/23/2017 11:54:03 AM Geolocation: (b) (9)



### IRON-20170823-002IR Repaired

2H GPU Run 2 Stainless Fitting Location:

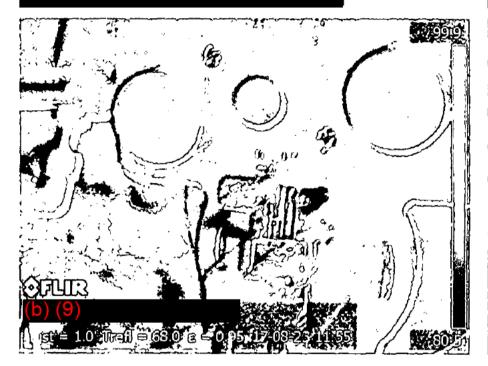
Date & Time: 8/23/2017 12:38:51 PM



## IRON-20170823-003IR Leaking

2H GPU Run 2 Level Controller Location:

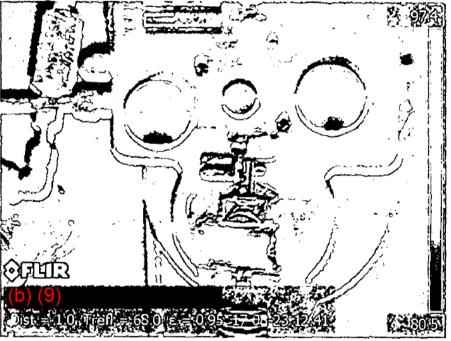
Date & Time: 8/23/2017 11:55:36 AM Geolocation: (b) (9)



### IRON-20170823-003IR Repaired

2H GPU Run 2 Level Controller Location:

Date & Time: 8/23/2017 12:41:39 PM



### IRON-20170823-004IR Leaking

Location: Dehy Stainless Fitting
Date & Time: 8/23/2017 11:57:15 AM
Geolocation: (b) (9)



### IRON-20170823-004IR Repaired

Location: Dehy Stainless Fitting
Date & Time: 8/23/2017 12:10:20 PM
Geolocation: (b) (9)

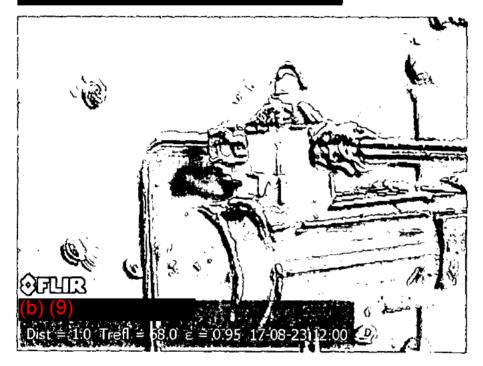


### IRON-20170823-005IR Leaking

Location: Fuel Skid Coalescent Filter Level Controller

Date & Time: 8/23/2017 12:00:10 PM

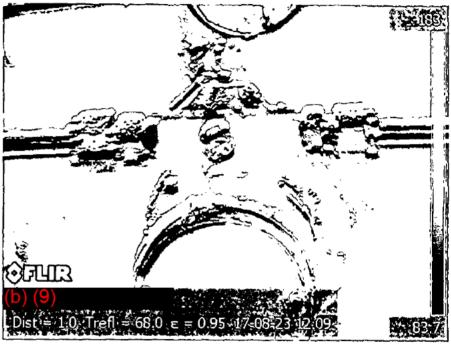
Geolocation: (b) (9)



## IRON-20170823-005IR Repaired

Location: Fuel Skid Coalescent Filter Level Controller

Date & Time: 8/23/2017 12:09:20 PM





# Rice Drilling D LLC

LDAR Inspection Conducted on August 24, 2017 Junkyard Dog Well Pad 1H, 3H



l Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



## Rice Drilling D LLC

Junkyard Dog 1H, 3H Leaking Components Report

Inspection Conducted on 08/24/2017

Total Leaking Components	6
Total repairs not made within 30 days	0

Leak#	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
JUNK-20170824-001	2H Well Head Grease Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES
JUNK-20170824-002	3H GPU Run 2 Grease Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES
JUNK-20170824-003	3H GPU Run 1 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES
JUNK-20170824-004	3H GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	B/24/2017	1st Tighted	8/24/2017	YES
JUNK-20170824-005	1H GPU Run 2 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Retaped	8/24/2017	YES
JUNK-20170824-006	1H GPU Run 1 Main Burner Stainless Fittin	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES

Inspection Personnel	OGI Certification Number
(b) (9)	163753

# LDAR FLIR Monitoring Form



WELLPAD	Junkyard Dog	Junkyard Dog wellpad					
ON-SITE CONTACT	Justin Stoner						
DATE TESTED	8/24/2017	START TIME	1530	END TIME	1645		
SKY CONDITIONS	Clear	AMBIENT TEMP	75	WIND SPEED	9 mph		

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/24/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC			
MONITORING TECHNICIAN	(b) (6)			
TECHNICIAN CERTIFIED? (Y/N)	YES			
TECHNICIAN YEARS OF EXPERIENCE	2 Months			

	LEAKS DETECTED (Attach additional sheets if necessary)						
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt		
1	2H Well Head Grease Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
2	ALL OBLID A A	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
3	3H GPU Run I High- Low Quick Exhaust	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
4	3H GPU Run 2 Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	l <sup>st</sup> Tightened		
5	1H GPU Run 2 High- Low Quick Exhaust	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped		
6	IH GPU Run I Main Burner Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (✓)	✓
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0

### **LDAR FLIR Monitoring Form**



AT LEAST ONE STILL IMAGE IS ATTACHED (✓)	<b>√</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (✓)	<b>√</b>
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	<b>V</b>
REPAIR STILL IMAGES ARE ATTACHED (✓ or N/A)	<b>√</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* ( )	<b>√</b>
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

 $\begin{aligned} & \underline{\text{ADDITIONAL OHIO CALCULATION:}} \\ & Leak\% = \frac{t_{I,eak} \times 100\%}{Count_{Est}} \end{aligned}$ 

230	
LEAKER COUNT	6
ESTIMATED COMPONENT COUNT*	624
LEAK PERCENT**	.96

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

	(b)	<b>(6)</b>	
Signature:	(3)	( )	

Date: 24 August 2017

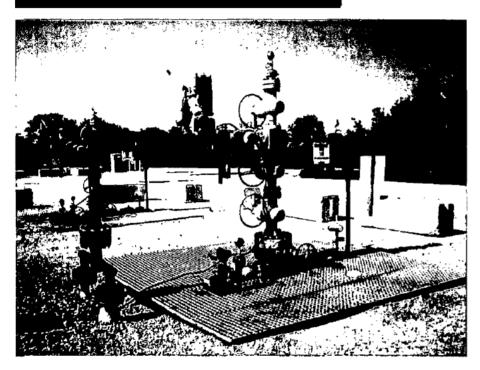
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

#### Initial Site Photo

Location: Well Head

Date & Time: 8/24/2017 4:04:35 PM

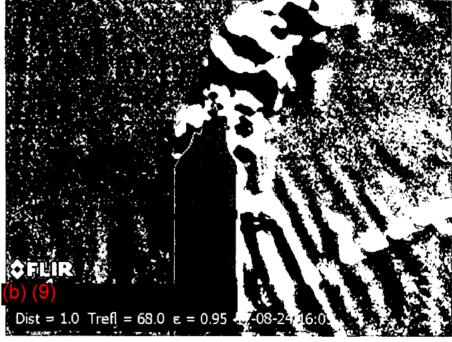
Geolocation: (b) (9)



### Camera Verification Photo

Location: GPU Stack

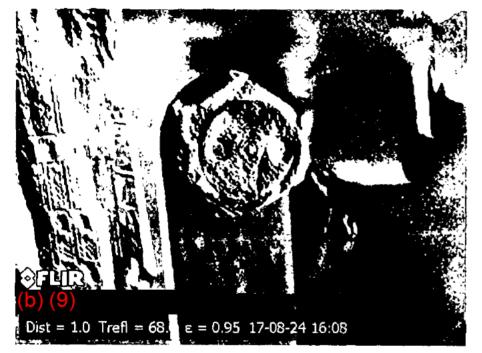
Date & Time: 8/24/2017 4:05:35 PM



### JUNK-20170824-001IR Leaking

Location: 2H Well Head Grease Fitting
Date & Time: 8/24/2017 4:09:01 PM

Geolocation: (b) (9)



## JUNK-20170824-001IR Repaired

Location: 2H Well Head Grease Fitting Date & Time: 8/24/2017 4:57:21 PM



### JUNK-20170824-002IR Leaking

Location: 3H GPU Run 2 Grease Fitting

Date & Time: 8/24/2017 4:24:33 PM

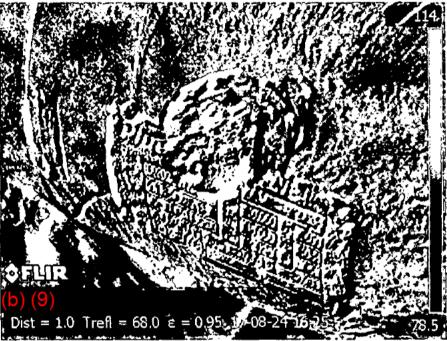
Geolocation: (b) (9)



### JUNK-20170824-002IR Repaired

Location: 3H GPU Run 2 Grease Fitting

Date & Time: 8/24/2017 4:25:25 PM

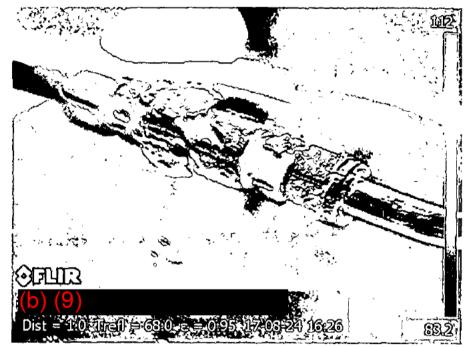


### JUNK-20170824-003IR Leaking

Location: 3H GPU Run ! High- Low Quick Exhaust

Date & Time: 8/24/2017 4:26:46 PM

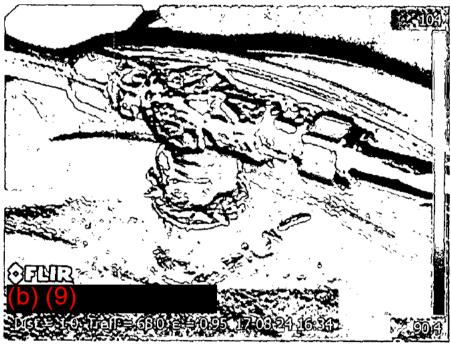
Geolocation: (b) (9)



### JUNK-20170824-003IR Repaired

Location: 3H GPU Run 1 High- Low Quick Exhaust

Date & Time: 8/24/2017 4:34:26 PM

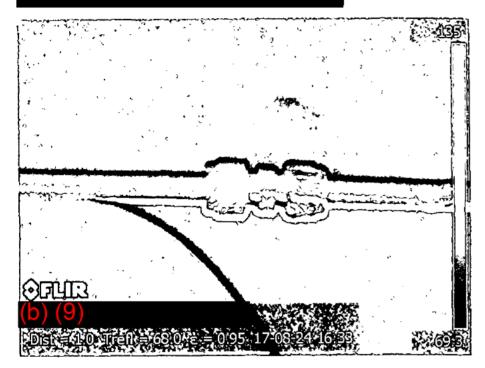


### JUNK-20170824-004IR Leaking

Location: 3H GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 4:33:27 PM

Geolocation: (b) (9)



### JUNK-20170824-004IR Repaired

Location: 3H GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 4:35:17 PM



### JUNK-20170824-005IR Leaking

Location: 1H GPU Run 2 High- Low Quick Exhaust
Date & Time: 8/24/2017 4:39:03 PM

Geolocation: (b) (9)



### JUNK-20170824-005IR Repaired

Location: 1H GPU Run 2 High- Low Quick Exhaust Date & Time: 8/24/2017 4:46:37 PM



### JUNK-20170824-006IR Leaking

Location: 1H GPU Run 1 Main Burner Stainless Fitting

Date & Time: 8/24/2017 4:44:04 PM

Geolocation: (b) (9)



### JUNK-20170824-006IR Repaired

Location: 1H GPU Run I Main Burner Stainless Fitting

Date & Time: 8/24/2017 4:45:05 PM





### Rice Drilling D LLC LDAR Inspection Conducted on August 16, 2017 Madusa Well Pad 2H, 4H, 6H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



## Rice Drilling D LLC

Madusa 2H, 4H, 6H Leaking Components Report

Inspection Conducted on 08/16/2017

Total Leaking Components	0	
Total repairs not made within 30 days	0	

		Testing	Testing	Inspection	Final Repair		Corrective Action		Repair confirmed
Łeak#	Location Description	Method	Equipment	Date	Deadline	Repair Date	Description	OGI Retest Date	with OGI?
No Leaking Components	No Leaking Components	OGI	FLIR GF 320	8/16/2017	9/15/2017	N/A	N/A	N/A	N/A

Inspection Personnel	OGI Certification Number
(b) (6)	163753

# **LDAR FLIR Monitoring Form**

**TECHNICIAN YEARS OF EXPERIENCE** 



					•	_	
WELLPAD	Madusa Well	Madusa Welipad					
ON-SITE CONTACT	Brandon St. Cl	air					
DATE TESTED	8/16/2017	START	TIME	1410	END TIME	1530	
SKY CONDITIONS	Clear	AMBIE	NT TEMP	81	WIND SPEED	3mph	
CAMERA MODEL			FLIR GF 3	20			
CAMERA ID NUMBER			S/N: 44401600				
CAMERA CERTIFICATION DATE  DAILY VERIFICATION DATE			8 August 2016 8/16/2017				
							MAXIMUM VIEWING DISTANCE
MONITORING COMPANY			Premier Energy Services, LLC				
MONITORING TECHNICIAN			(b) (6)				
TECHNICIAN CERTIFIED? (Y/N)			YES				
TECHNICIAN YEARS OF EXPERIENCE			2 Months				

Location Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1				
2				
3				
4				
5				
6				

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( </td <td>N/A</td>	N/A
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0

### **LDAR FLIR Monitoring Form**



AT LEAST ONE STILL IMAGE IS ATTACHED (V)	<b>~</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (~)	<b>✓</b>
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	N/A
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	N/A
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	<b>✓</b>
DELAY OF REPAIR FORMS COMPLETE (✓ or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{t_{Leak}}{Country} \times 100\%$ 

LEAKER COUNT	0
ESTIMATED COMPONENT COUNT*	788
LEAK PERCENT**	0

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature	(b)	(6)	Date: 16 August 2017
_			

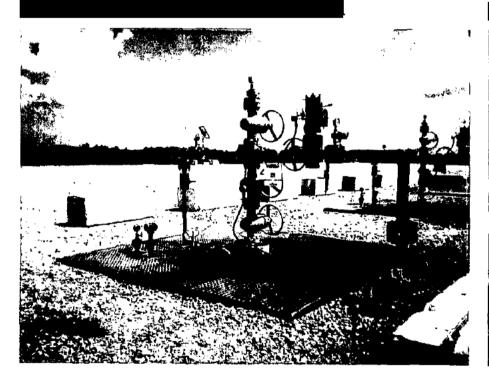
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

#### **Initial Site Photo**

Location: Well Head

Date & Time: 8/16/2017 2:24:32 PM

Geolocation: (b) (9)



#### Camera Verification Photo

Location: GPU

GPU Stack

Date & Time: 8/16/2017 2:27:35 PM

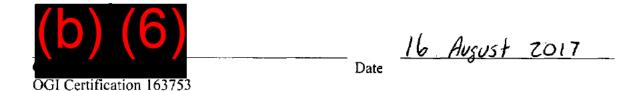




Premier Energy
Services, LLC
1 Dane St.
Clarksburg, WV 26301
304.624.0989 | Office
304.624.3106 | Fax
http://premierenergyserviceswv.com

#### Certification

I hereby certify that the FLIR GF 320 OGI Camera with Serial Number 44401600 has been operated and maintained in accordance with the manufacturer's operation and maintenance instructions.







# CERTIFIED

Optical Gas Imaging Thermographer

THIS IS TO CERTIFY THAT



HAS SUCCESSFULLY COMPLETED THE FOLLOWING REQUIREMENTS FOR CERTIFICATION: ATTENDING OUR TRAINING COURSE, PASSING THE REQUIRED EXAMS, AND SUBMITTING A FIELD ASSIGNMENT.



CERTIFICATION NO.

163753

EXPIRATION DATE: JUNE 15, 2022

ITC CERTIFICATION RENEWAL.

20 CREDITS

Infrared Training Center - Americas

9 TOWNSEND WEST, NASHHA, NH 93063 - AN ISO 9001 REGISTERED COMPANY



Customer: RICE ALL Location: MEDV 54 Work Activity Description: ADA Members of Work Team: (b) (6 Signature: (b)		Date: <u>9-16-17</u> Truck #
Work Sequences	Hazards or Potential Accidents	Recommendations to Eliminate/Reduce Hazard
Travel To/From Location	Driving Incidents, Inclement Weather, Wildlife Encounters	SAFE DRIVENG/SEATBELTS
Work Site Assessment Establish Muster Point, Designated Smoking Areas	Vehicle Traffic (Trucks)/ Spill Possibilities from Operational Equipment  Muster Established and Known (below)	BE ANARE OF SUBROUNDINGS MAIN GATE
Provide Work Steps Below and Perform Tailgate Meeting Topic: VERT CLESAFOTY	Slips, Trips, and Falls caused by uneven terrain, or mud and icy areas, lines, debris, steps or containment	3 POINTS OF CONTACT
1. DRIVE TO THE LOCATION 2. WALK AROUND LOCATION AND IDENTIFY POTENTIAL RISKS 3. PERFORM HOT WORK	Burns from compressor components and heaters  Excessive noise levels from compressors	GLOVES/FRI/PPE HEARING PROTECTION
ASSESSMENT WITH 4-GAS METER AND DOCUMENT 4. POWER ON INSPECTION	Exposure to pinch points to hands or body by valves or structures (production equipment, heavy equipment and vehicles)	DENES / HIST PPE
EQUIPMENT	Potential for explosion from Leaking components	HOT WORK PERMIT
<ul><li>5. WALK INSPECTION ROUTE AND COMMENCE INSPECTION.</li><li>6. RECORD ALL FINDINGS AND DOUBLE CHECK INFORMATION</li></ul>	Gas asphyxiation	4-GAS METER
Perform General Housekeeping/Cleanup Barricading	At all times	
Ensure All Gates are Closed and Locked	If encountered	
	REMEMBER: STOP WORK AUTHORITY	
Muster Points:	Additional PPE Required	Other
n India in the comment	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Livering and a company of the latest Communication of the

Muster Points:

Primary: MALN GATE

Hard Hat

Ear protection

Safety Glasses

4-Gas Meter

Fire Resistant Clothing

Steel Toe Boots

High Vis Vest

Additional PPE Required

WEATHER CONDITIONS:

Fartly Sum y

TEMPERATURE:

Company Representative:

High Vis Vest



### Rice Drilling D LLC LDAR Inspection Conducted on August 24, 2017 Monster Mut Well Pad 1H, 3H, 5H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Monster Mut 1H, 3H, 5H Leaking Components Report

Inspection Conducted on 08/24/2017

Total Leaking Components	8
Total repairs not made within 30 days	0

Leak#	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Déadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
MONS-20170824-001	Dehy Level Controller Stainless Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
MONS-20170824-002	5H GPU Run 1 Burner Stainless Fitting	OG!	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
MONS-20170824-003	5H GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
MONS-20170824-004	5H GPU Run 2 Stainless Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES
MONS-20170824-005	1H GPU Run ESD Diaphragm	OGI	FLIR GF 320	8/24/2017	9/23/2017	9/1/2017	1st Replaced	9/1/2017	YES
MONS-20170824-006	1H GPU Run 1 High- Low Supply Line	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YE\$
MONS-20170824-007	1H GPU Run 1 High- Low Switch GFI	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	· YES
MONS-20170824-008	1H GPU High- Low Box Stainless Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tightened	8/24/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753

# LDAR FLIR Monitoring Form



WELLPAD	Monster Mut	Monster Mut Wellpad				
ON-SITE CONTACT	Justin Stogner				<del> </del>	
DATE TESTED	8/24/2017	START TIME	1330	END TIME	1530	
SKY CONDITIONS	Clear	AMBIENT TEMP	77	WIND SPEED	3	

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/24/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC	
MONITORING TECHNICIAN	(b) (6)	
TECHNICIAN CERTIFIED? (Y/N)	YES	
TECHNICIAN YEARS OF EXPERIENCE	2 Months	

	LEAKS DETECTED (Attach additional sheets if necessary)							
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt			
1	Dehy Level Controller Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
2	5H GPU Run 1 Burner Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
3	5H GPU Run 2 Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
4	5H GPU Run 2 Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
5	1H GPU Run ESD Diaphragm	8/24/2017	9/1/2017	FLIR GF 320 S/N: 44401600	Ist Replaced			
6	1H GPU Run 1 High- Low Supply Line	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	l
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (V)	1
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED ( </th <th><del></del></th>	<del></del>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1/2)	<b>√</b>
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	<b>*</b>
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* ( < )	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

#### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{a^k \times 100\%}{Count_{Est}}$$

LEAKER COUNT	8
ESTIMATED COMPONENT COUNT*	849
LEAK PERCENT**	.94

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors

Signature:_	(b) (6)	Date:	1 September 2017
		_	

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.



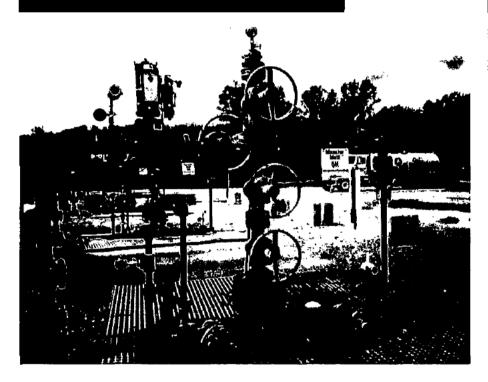
LEAKS DETECTED (Attach additional sheets if necessary)					
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
7	IH GPU Run I High- Low Switch GFI	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
8	IH GPU High- Low Box Stainless Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened

#### Initial Site Photo

Location: Well Head

Date & Time: 8/24/2017 1:47:18 PM

Geolocation: (b) (9)



#### Camera Verification Photo

Location: GPU Stack

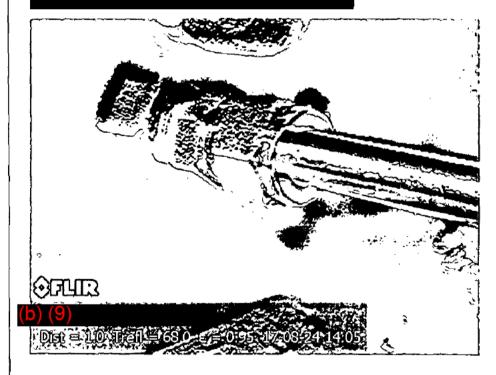
Date & Time: 8/24/2017 1:48:18 PM



#### MONS-20170824-001IR Leaking

Dehy Level Controller Stainless Fitting Location:

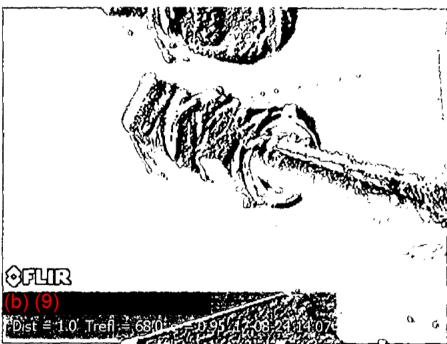
Date & Time: 8/24/2017 2:06:01 PM Geolocation: N(b) (9)



#### MONS-20170824-001IR Repaired

Dehy Level Controller Stainless Fitting Location:

Date & Time: 8/24/2017 2:07:26 PM Geolocation: (b) (9)



#### MONS-20170824-002IR Leaking

Location: 5H GPU Run 1 Burner Stainless Fitting

Date & Time: 8/24/2017 2:30:42 PM

Geolocation: (b) (9)



#### MONS-20170824-002IR Repaired

Location: 5H GPU Run 1 Burner Stainless Fitting

Date & Time: 8/24/2017 2:47:26 PM

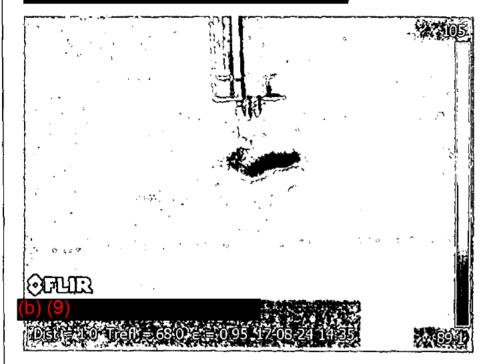


# MONS-20170824-003IR Leaking

Location: 5H GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 2:35:50 PM

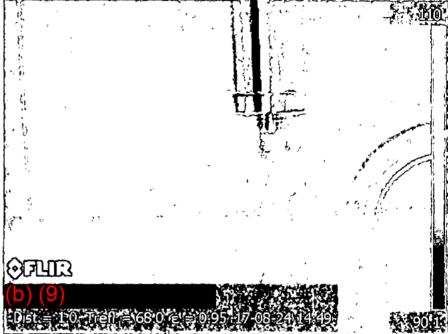
Geolocation: (b) (9)



# MONS-20170824-003IR Repaired

Location: 5H GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 2:49:19 PM



#### MONS-20170824-004IR Leaking

Location: 5H GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 2:37:01 PM

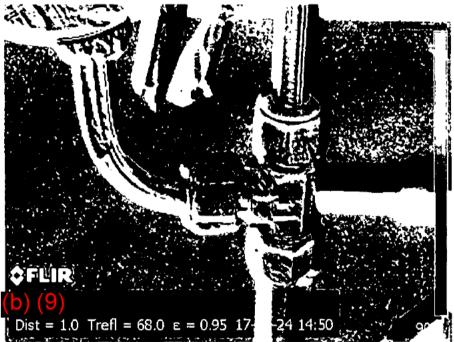
Geolocation: (b) (9)



#### MONS-20170824-004IR Repaired

Location: 5H GPU Run 2 Stainless Fitting

Date & Time: 8/24/2017 2:50:39 PM



#### MONS-20170824-005IR Leaking

Location: 1H GPU Run ESD Diaphragm

Date & Time: 8/24/2017 2:55:42 PM

Geolocation: (b) (9)



#### MONS-20170824-005IR Repaired

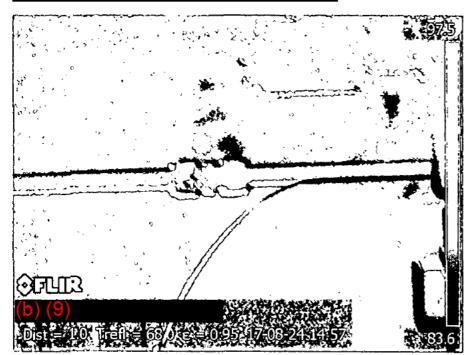
Location: 1H GPU Run ESD Diaphragm

Date & Time: 9/1/2017 1:56:05 PM



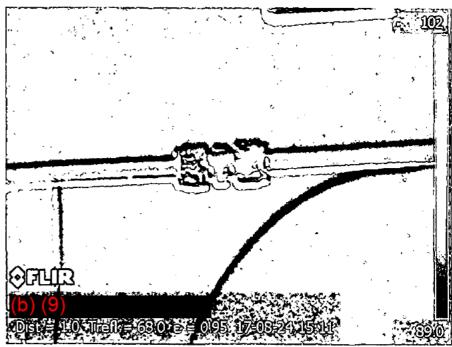
#### MONS-20170824-006IR Leaking

Location: 1H GPU Run 1 High- Low Supply Line
Date & Time: 8/24/2017 2:57:06 PM
Geolocation: (b) (9)



# MONS-20170824-006IR Repaired

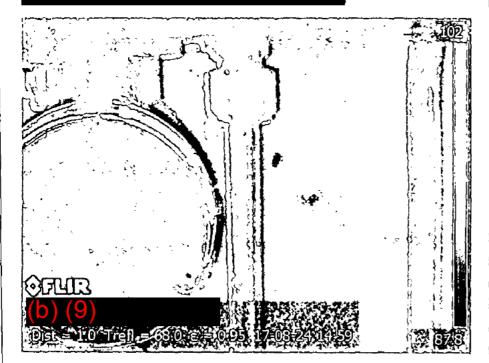
Location: 1H GPU Run 1 High- Low Supply Line
Date & Time: 8/24/2017 3:11:36 PM
Geolocation: (b) (9)



#### MONS-20170824-007IR Leaking

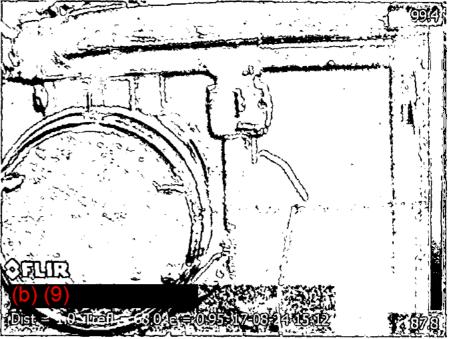
Location: 1H GPU Run 1 High- Low Switch GFI Date & Time: 8/24/2017 2:59:43 PM

Geolocation: (b) (9)



# MONS-20170824-007IR Repaired

Location: 1H GPU Run 1 High- Low Switch GFI
Date & Time: 8/24/2017 3:12:31 PM

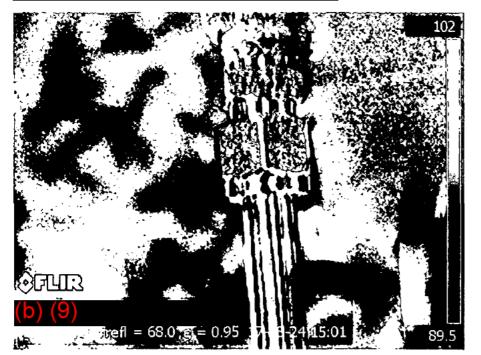


#### MONS-20170824-008IR Leaking

Location: 1H GPU High- Low Box Stainless Fitting

Date & Time: 8/24/2017 3:01:46 PM

Geolocation: (b) (9)



#### MONS-20170824-008IR Repaired

Location: 1H GPU High- Low Box Stainless Fitting

Date & Time: 8/24/2017 3:13:48 PM





Rice Drilling D, LLC LDAR Inspection Conducted on August 24, 2017 Spitfire Well Pad 1H, 3H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Spitfire 1H, 3H Leaking Components Report

Inspection Conducted on 08/24/2017

Total Leaking Components	4
Total repairs not made within 30 days	0

				"					
		Testing	Testing	Inspection	Final Repair		Corrective Action	1	Repair confirmed
Leak#	Location Description	Method	Equipment	Date	Deadline	Repair Date	Description	OG! Retest Date	with OGI?
SPIT-20170824-001	Dehy Liquid level Controller	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Cleaned	8/24/2017	YES
SPIT-20170824-002	3H GPU Run 1 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES
SPIT-20170824-003	1H GPU Run 1 High- Low Quick Exhaust	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES
SPIT-20170824-004	1H GPU Run 2 Piper Valve Grease Fitting	OGI	FLIR GF 320	8/24/2017	9/23/2017	8/24/2017	1st Tighted	8/24/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753



WELLPAD	Spitfire wellpad	1			
ON-SITE CONTACT	Justin Stoner				
DATE TESTED	8/24/2017	START TIME	1030	END TIME	1305
SKY CONDITIONS	Clear	AMBIENT TEMP	77	WIND SPEED	3

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/24/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

Location Description		Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1	Dehy Liquid level Controller	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Cleaned
2	3H GPU Run   High- Low Quick Exhaust	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
3	IH GPU Run I High- Low Quick Exhaust	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
4	IH GPU Run 2 Piper Valve Grease Fitting	8/24/2017	8/24/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
5					
6					

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (*)	<b>√</b>
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (✓)	<b>V</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED ( </td <td><b>√</b></td>	<b>√</b>
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	1
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	<b>√</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

<sup>\*</sup>if either plan or path were not followed, please include a written description and explanation with this form.

 $\frac{\textit{ADDITIONAL OHIO CALCULATION:}}{\textit{Leak}\%} = \frac{t_{\textit{Leak}}}{\textit{Count}_{\textit{Est}}} \times 100\%$ 

LEAKER COUNT	4
ESTIMATED COMPONENT COUNT*	624
LEAK PERCENT**	.64

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

	(b) (6)				_
Signature:	( / ( - /	Date: _	24	AUGUST	2017

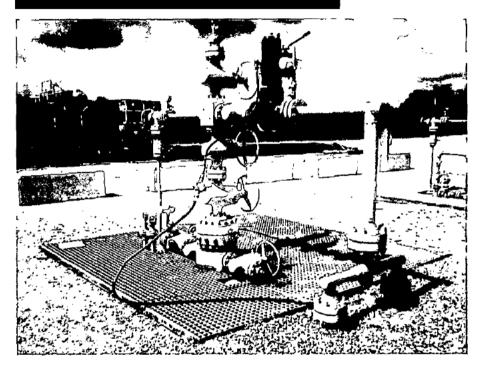
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

#### Initial Site Photo

Location: Well Head

Date & Time: 8/24/2017 11:50:15 AM

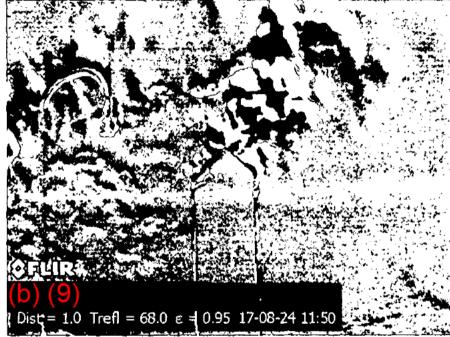
Geolocation: (b) (9)



#### Camera Verification Photo

Location: GPU Stack

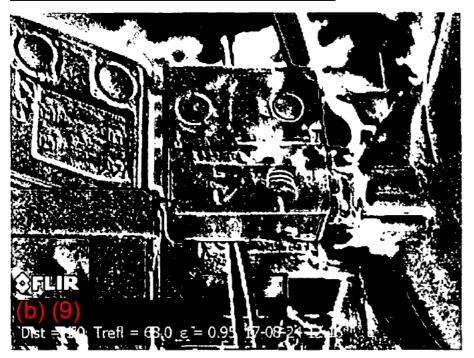
Date & Time: 8/24/2017 11:51:05 AM



#### SPIT-20170824-001IR Leaking

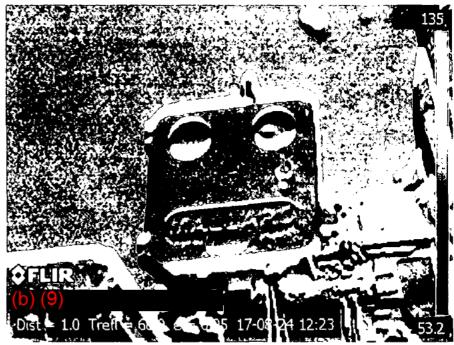
Location: Dehy Liquid level Controller
Date & Time: 8/24/2017 12:16:29 PM

Geolocation: (b) (9)



#### SPIT-20170824-001IR Repaired

Location: Dehy Liquid level Controller
Date & Time: 8/24/2017 12:23:14 PM



#### SPIT-20170824-002IR Leaking

3H GPU Run 1 High- Low Quick Exhaust Location:

Date & Time: 8/24/2017 12:30:13 PM

Geolocation: (b) (9)



#### SPIT-20170824-002IR Repaired

Location: 3H GPU Run 1 High- Low Quick Exhaust Date & Time: 8/24/2017 12:31:21 PM



#### SPIT-20170824-003IR Leaking

1H GPU Run 1 High- Low Quick Exhaust Location:

Date & Time: 8/24/2017 12:43:36 PM

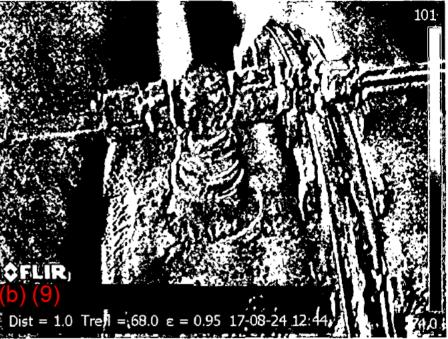
Geolocation: (b) (9)



#### SPIT-20170824-003IR Repaired

Location: 1H GPU Run 1 High- Low Quick Exhaust

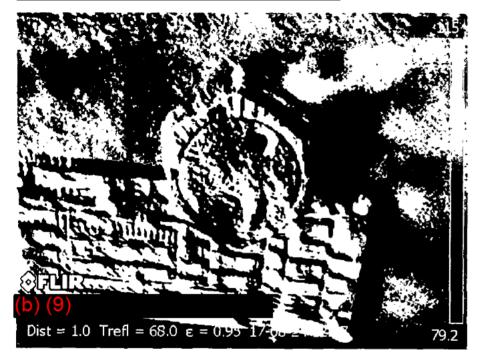
Date & Time: 8/24/2017 12:44:27 PM Geolocation: N(b) (9)



#### SPIT-20170824-004IR Leaking

1H GPU Run 2 Piper Valve Grease Fitting Location:

Date & Time: 8/24/2017 12:47:38 PM Geolocation: (b) (9)



#### SPIT-20170824-004IR Repaired

1H GPU Run 2 Piper Valve Grease Fitting Location:

Date & Time: 8/24/2017 12:48:51 PM





# Rice Drilling D LLC LDAR Inspection Conducted on August 16, 2017 Taco Cat Well Pad 1H, 3H, 5H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



# Rice Drilling D LLC

Taco Cat 1H, 3H, 5H Leaking Components Report

Inspection Conducted on 08/16/2017

Total Leaking Components	11
Total repairs not made within 30 days	0

Leak #	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OGI?
	Fuel Skid Dump Control for Concentrate								
TACO-20170816-001	Separator	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Retaped	8/16/2017	YES
TACO-20170816-002	1H GPU Run 2 Piper Valve Grease Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Greased	8/16/2017	YES
TACO-20170816-003	1H GPU Run 1 Main Burner Stainless Fining	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-004	3H GPU Run 2 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-005	3H GPU Run 2 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-006	3H GPU Run 1 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	€/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-007	3H GPU Run 1 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-008	5H GPU Run 2 High Low Quick Exhaust	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Greased	8/17/2017	YES
TACO-20170816-009	5H GPU Run 2 Fuel Gas Stainless Fitting	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-010	5H GPU Run 2 Fuel Gas Stainless Fitting	ogi	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened	8/16/2017	YES
TACO-20170816-011	5H GPU Run 1 High Low Quick Exhaust	OGI	FLIR GF 320	8/16/2017	9/15/2017	8/16/2017	1st Tightened 2nd Replaced	8/16/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753



WELLPAD	Taco Cat Wellp	Taco Cat Wellpad						
ON-SITE CONTACT	Brandon St. Clai	Brandon St. Clair						
DATE TESTED	8/16/2017	START TIME	0815	END TIME	1215			
SKY CONDITIONS	Clear	AMBIENT TEMP	81	WIND SPEED	3mph			

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/16/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

	LEAKS DETECTED (Attach additional sheets if necessary)						
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt		
1	Fuel Skid Dump Control for Concentrate Separator	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	l <sup>st</sup> Retaped		
2	1H GPU Run 2 Piper Valve Grease Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	i <sup>st</sup> Greased		
3	1 H GPU Run 1 Main Burner Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		
4	3H GPU Run 2 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	I <sup>st</sup> Tightened		
5	3H GPU Run 2 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	l <sup>st</sup> Tightened		
6	3H GPU Run 1 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened		

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	1
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( </td <td></td>	
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



	LEAKS DETECTED (Attach additional sheets if necessary)							
Lo	cation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt			
	BH GPU Run 1 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
8	5H GPU Run 2High Low Quick Exhaust	8/16/2017	8/17/2017	FLIR GF 320 S/N: 44401600	i <sup>st</sup> Greased			
9	5H GPU Run 2 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
	5H GPU Run 2 Fuel Gas Stainless Fitting	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened			
11	5H GPU Run 1 High Low Quick Exhaust	8/16/2017	8/16/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened 2 <sup>nd</sup> Replaced			



AT LEAST ONE STILL IMAGE IS ATTACHED (*)	<b>√</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED ( </td <td></td>	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	<b>√</b>
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	<b>√</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	1
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{\iota_{Leak} \times 100\%}{Count}$ 

LEAKER COUNT	11
ESTIMATED COMPONENT COUNT*	849
LEAK PERCENT**	1.29 %

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature: (b) (6) Date: <u>lb August 2017</u>

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

#### **Initial Site Photo**

Location: Well Head

Date & Time: 8/16/2017 8:40:38 AM

Geolocation: (b) (9)



# Camera Verification Photo

Location: GPU Stack

Date & Time: 8/16/2017 8:41:04 AM



#### TACO-20160816-001IR Leaking

Location: Fuel Skid Dump Control for Concentrate Separator

Date & Time: 8/16/2017 8:55:01 AM

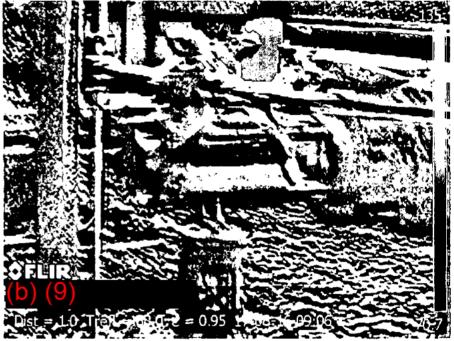
Geolocation: (b) (9)



#### TACO-20160816-001IR Repaired

Location: Fuel Skid Dump Control for Concentrate Separator

Date & Time: 8/16/2017 9:06:29 AM



#### TACO-20160816-002IR Leaking

1H GPU Run 2 Piper Valve Grease Fitting Location:

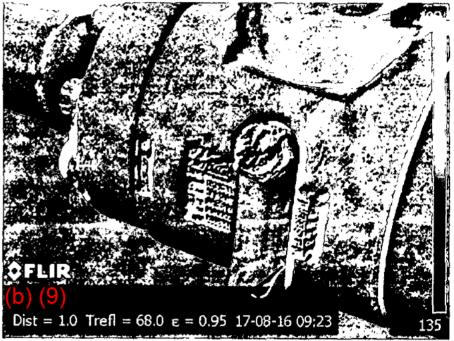
Date & Time: 8/16/2017 9:11:07 AM Geolocation: (b) (9)



#### TACO-20160816-002IR Repaired

1H GPU Run 2 Piper Valve Grease Fitting Location:

Date & Time: 8/16/2017 9:23:24 AM Geologation: (b) (9)

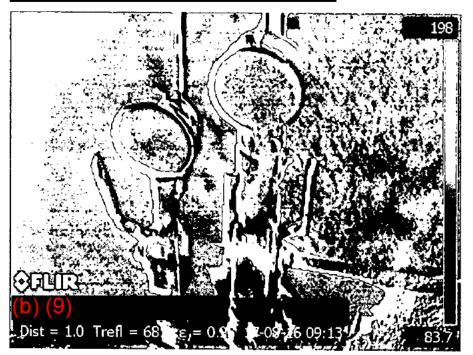


#### TACO-20160816-003IR Leaking

Location: 1H GPU Run 1 Main Burner Stainless Fitting

Date & Time: 8/16/2017 9:13:51 AM

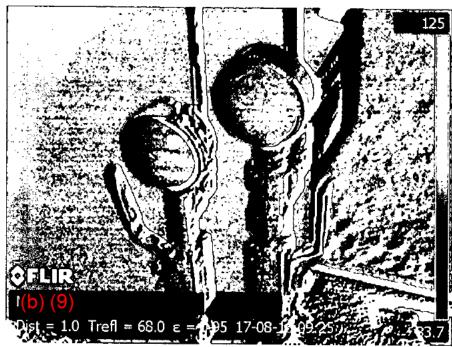
Geolocation: (b) (9)



# TACO-20160816-003IR Repaired

Location: 1H GPU Run 1 Main Burner Stainless Fitting

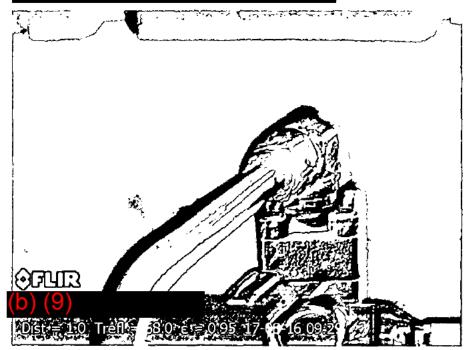
Date & Time: 8/16/2017 9:25:58 AM



#### TACO-20160816-004IR Leaking

3H GPU Run 2 Fuel Gas Stainless Fitting Location:

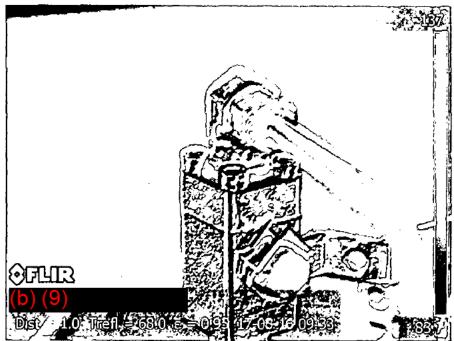
Date & Time: 8/16/2017 9:29:22 AM Geologation: (b) (9)



#### TACO-20160816-004IR Repaired

3H GPU Run 2 Fuel Gas Stainless Fitting Location:

Date & Time: 8/16/2017 9:33:19 AM Geolocation: (b) (9)



#### TACO-20160816-005IR Leaking

Location: 3H GPU Run 2 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 9:35:21 AM

Geolocation: (b) (9)



### TACO-20160816-005IR Repaired

Location: 3H GPU Run 2 Fuel Gas Stainless Fitting

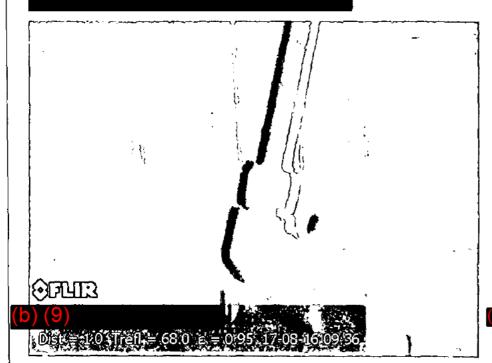
Date & Time: 8/16/2017 9:42:29 AM



#### TACO-20160816-006IR Leaking

3H GPU Run I Fuel Gas Stainless Fitting Location:

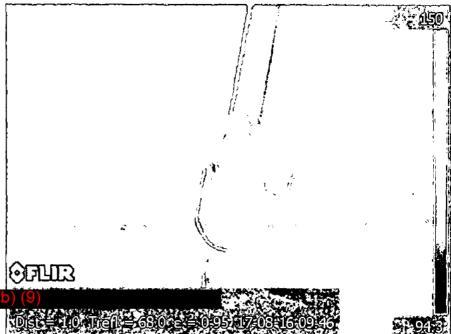
Date & Time: 8/16/2017 9:36:43 AM Geolocation: (b) (9)



# TACO-20160816-006IR Repaired

3H GPU Run 1 Fuel Gas Stainless Fitting Location:

Date & Time: 8/16/2017 9:46:56 AM Geolocation: (b) (9)

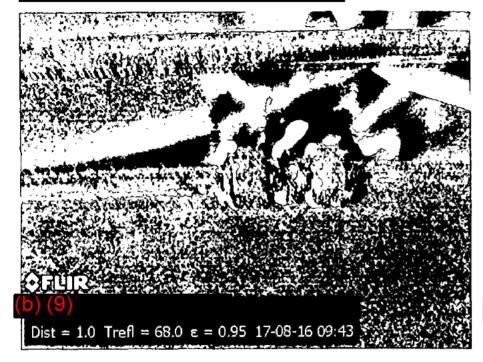


#### TACO-20160816-007IR Leaking

Location: 3H GPU Run 1 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 9:43:39 AM

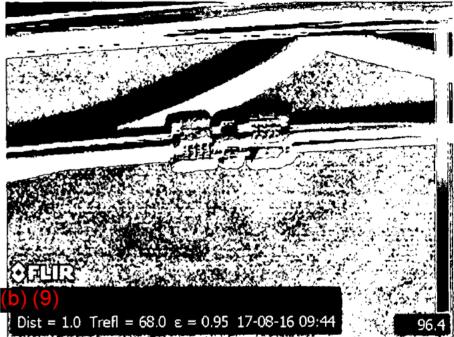
Geolocation: (b) (9)



#### TACO-20160816-007IR Repaired

Location: 3H GPU Run 1 Fuel Gas Stainless Fitting

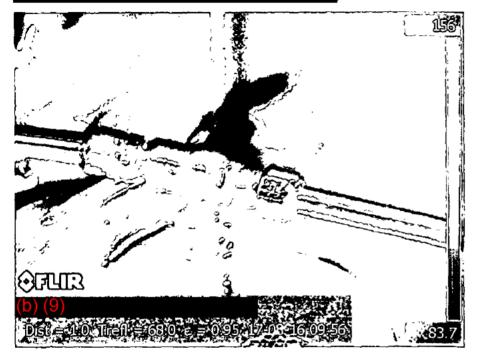
Date & Time: 8/16/2017 9:44:51 AM



#### TACO-20160816-008IR Leaking

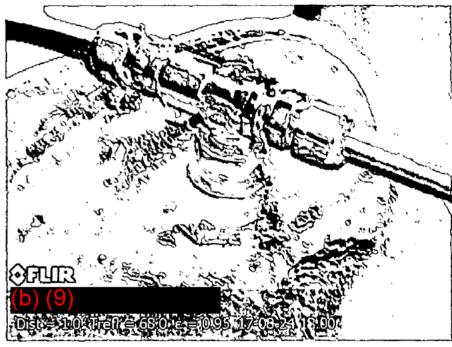
Location: 5H GPU Run 2 High Low Quick Exhaust Date & Time: 8/16/2017 9:56:38 AM

Geolocation: (b) (9)



# TACO-20160816-008IR Repaired

Location: 5H GPU Run 2 High Low Quick Exhaust
Date & Time: 8/24/2017 6:00:35 PM
Geolocation: (b) (9)

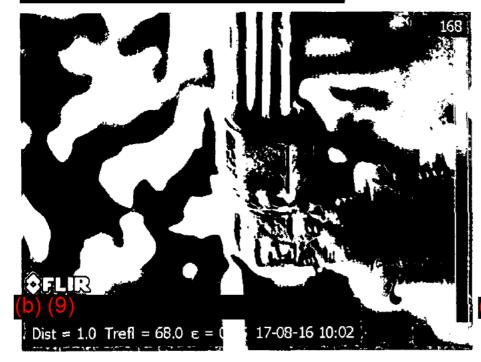


#### TACO-20160816-009IR Leaking

Location: 5H GPU Run 2 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 10:02:07 AM

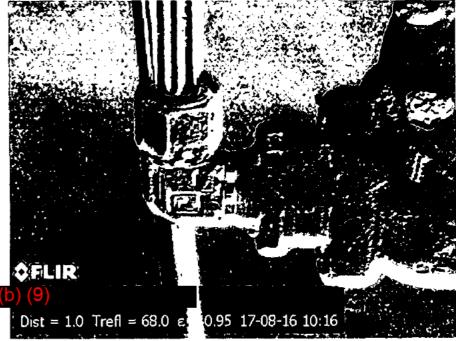
Geolocation: (b) (9)



#### TACO-20160816-009IR Repaired

Location: 5H GPU Run 2 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 10:16:45 AM

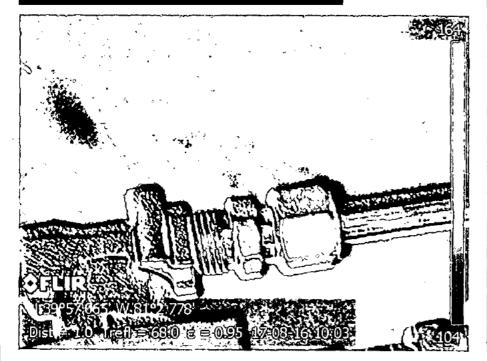


#### TACO-20160816-010IR Leaking

Location: 5H GPU Run 2 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 10:03:05 AM

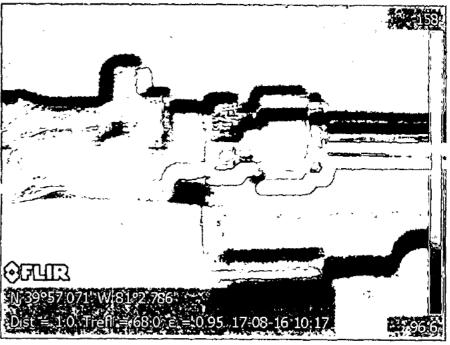
Geolocation: (b) (9)



# TACO-20160816-010IR Repaired

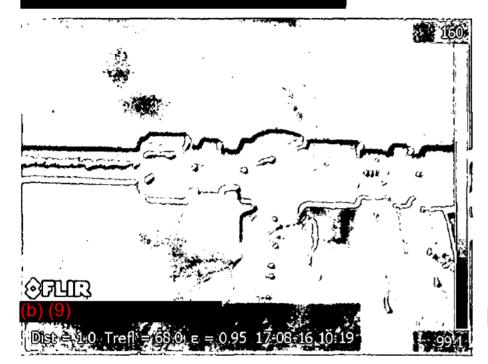
Location: 5H GPU Run 2 Fuel Gas Stainless Fitting

Date & Time: 8/16/2017 10:17:20 AM



## TACO-20160816-011IR Leaking

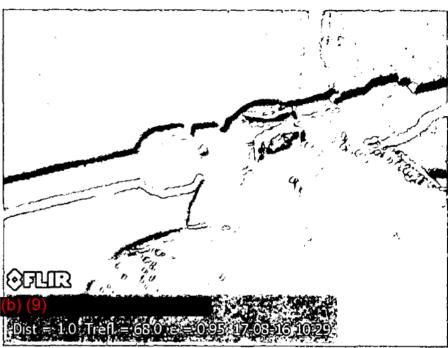
Location: 5H GPU Run 1 High Low Quick Exhaust
Date & Time: 8/16/2017 10:19:27 AM
Geolocation: (b) (9)



## TACO-20160816-011IR Repaired

5H GPU Run 1 High Low Quick Exhaust Location:

Date & Time: 8/16/2017 10:29:14 AM





# Rice Drilling D LLC LDAR Inspection Conducted on August 23, 2017 Thrasher Well Pad 1H, 3H, 5H



l Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



## Rice Drilling D LLC

Thrasher 1H, 3H, 5H Leaking Components Report

Inspection Conducted on 08/23/2017

1	Total Leaking Components	3
	Total repairs not made within 30 days	0

ثأر كالمساور المتركون									
		Testing	Testing	Inspection	Final Repair		Corrective Action		Repair confirmed
Leak #	Location Description	Method	Equipment	Date	Deadline	Repair Date	Description	OGI Retest Date	with QGI?
THRA-20170823-001	5H GPU Run 1 High- Low Quick Exhaust	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES
THRA-20170823-002	1H GPU Run 2 High- Low Quick Exhaust	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Replaced	8/23/2017	YEŞ
THRA-20170823-003	Dehy Supply Gas Stainless Fitting	OGI	FLIR GF 320	8/23/2017	9/22/2017	8/23/2017	1st Tightened	8/23/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753



WELLPAD	Thrasher wellp	ad							
ON-SITE CONTACT	Jed Marshall								
DATE TESTED	8/23/2017	START TIME	1315	END TIME	1515				
SKY CONDITIONS	Cloudy	AMBIENT TEMP	74	WIND SPEED	7 mph				

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/23/2017
MAXIMUM VIEWING DISTANCE	2.5 feet

MONITORING COMPANY	Premier Energy Services, LLC			
MONITORING TECHNICIAN	(b) (6)			
TECHNICIAN CERTIFIED? (Y/N)	YES			
TECHNICIAN YEARS OF EXPERIENCE	2 Months			

	LEAKS DETECTED (Attach additional sheets if necessary)								
Lo	cation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description For Each Attempt				
1	5H GPU Run 1 High- Low Quick Exhaust	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
2	1H GPU Run 2 High- Low Quick Exhaust	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Replaced				
3	Dehy Supply Gas Stainless Fitting	8/23/2017	8/23/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened				
4									
5									
6									

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED ( </th <th>7</th>	7
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (✓)	<b>✓</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (~)	<b>√</b>
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	<b>V</b>
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	<b>V</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	7
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

<sup>\*</sup>if either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{Leak \times 100\%}{Count_{Est}}$$

LEAKER COUNT	3
ESTIMATED COMPONENT COUNT*	1095
LEAK PERCENT**	.27

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.



\_\_\_Date: <u>23\_\_AVCUST\_c</u>2/7

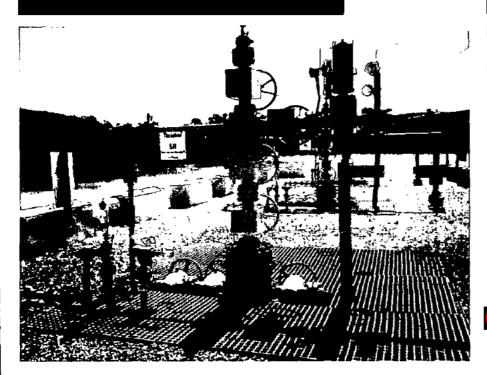
<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

## Initial Site Photo

Location: Well Head

Date & Time: 8/23/2017 1:52:33 PM

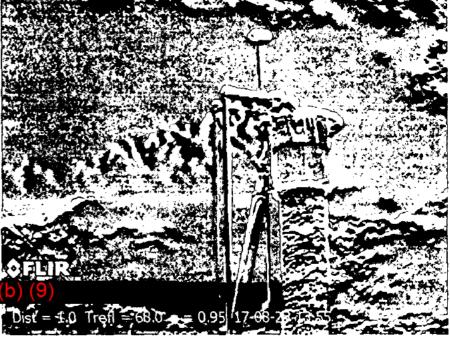
Geolocation: (b) (9)



#### Camera Verification Photo

Location: Dehy Stack

Date & Time: 8/23/2017 1:55:08 PM



## THRA-20170823-001IR Leaking

Location: 5H GPU Run I High- Low Quick Exhaust

Date & Time: 8/23/2017 1:59:17 PM

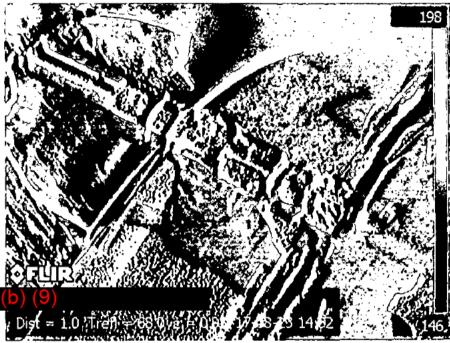
Geolocation: (b) (9)



#### THRA-20170823-001IR Repaired

Location: 5H GPU Run I High- Low Quick Exhaust

Date & Time: 8/23/2017 2:32:33 PM



## THRA-20170823-002IR Leaking

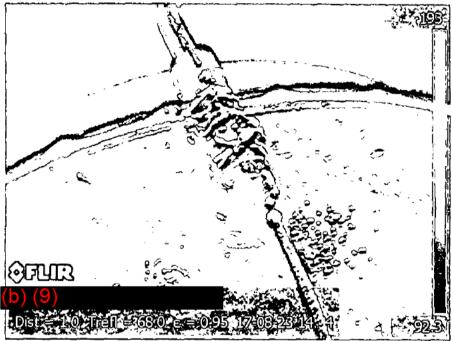
Location: 1H GPU Run 2 High- Low Quick Exhaust
Date & Time: 8/23/2017 2:19:33 PM
Geolocation: (b) (9)



## THRA-20170823-002IR Repaired

1H GPU Run 2 High- Low Quick Exhaust Location:

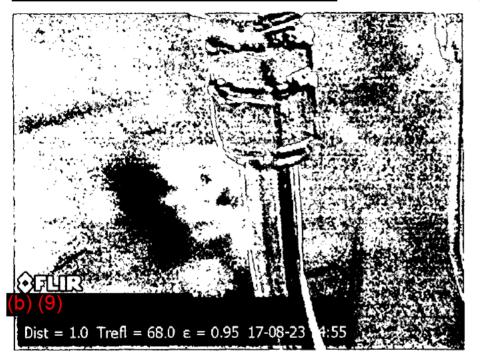
Date & Time: 8/23/2017 2:34:50 PM



## THRA-20170823-003IR Leaking

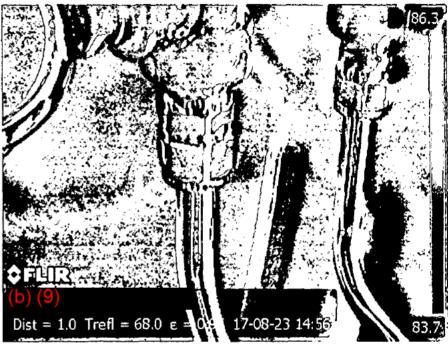
Location: Dehy Supply Gas Stainless Fitting
Date & Time: 8/23/2017 2:55:31 PM

Geolocation: (b) (9)



## THRA-20170823-003IR Repaired

Location: Dehy Supply Gas Stainless Fitting
Date & Time: 8/23/2017 2:56:40 PM





Rice Drilling D, LLC LDAR Inspection Conducted on August 22, 2017 Thunderstruck Well Pad 2H, 4H, 6H, 8H, 10H



1 Dane St. Clarksburg, WV, 26301 304-624-0989 www.premierenergyservices.com



## Rice Drilling D LLC

Thunderstruck 2H, 4H, 6H, 8H, 10H Leaking Components Report

Inspection Conducted on 08/22/2017

Total Leaking Components	6
Total repairs not made within 30 days	0

		Testing	Testing	Inspection	Final Repair		Corrective Action		Repair confirmed
Leak#	Location Description	Method	Equipment	Date	Deadline	Repair Date	Description	OGI Retest Date	with OGI?
THUN-20170822-001	6H GPU Run 2 Level Controller Pilot	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Replaced	8/22/2017	YES
THUN-20170822-002	4H GPU Run 1 Pilot	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
THUN-20170822-003	4H GPU Run 2 Solenoid Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	I <sup>™</sup> Tightened	8/22/2017	YES
THUN-20170822-004	8H GPU Run I High- Low Quick Exhaust	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	181 Replaced	8/22/2017	YES
THUN-20170822-005	2HA GPU Run I Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	l <sup>st</sup> Tightened	8/22/2017	YES
THUN-20170822-006	10HA GPU Run 1 Solenoid Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	l <sup>at</sup> Tightened	8/22/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753



WELLPAD	Thunderstruck	Thunderstruck wellpad				
ON-SITE CONTACT	Jed Marshall					
DATE TESTED	8/22-23/2017	START TIME	1350 1515	END TIME	1530 1600	
SKY CONDITIONS	Cloudy	AMBIENT TEMP	84	WIND SPEED	10	

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/22/2017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

	LEAKS DETECTED (Attach additional sheets if necessary)					
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt	
1	6H GPU Run 2 Level Controller Pilot	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	L <sup>st</sup> Replaced	
2	4H GPU Run 1 Pilot	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	Ist Tightened	
3	4H GPU Run 2 Solenoid Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	I <sup>st</sup> Tightened	
4	8H GPU Run I High- Low Quick Exhaust	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	is Replaced	
5	2HA GPU Run I Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened	
6	10HA GPU Run 1 Solenoid Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened	

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (<)	· ·
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (*)	/
ALL STILL IMAGES ARE DATED AND GIS ENABLED (*)	<b>√</b>
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	4
REPAIR STILL IMAGES ARE ATTACHED (✓ or N/A)	<b>V</b>
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	<b>-</b>
DELAY OF REPAIR FORMS COMPLETE (✓ or N/A)	N/A

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{nt_{Leak}}{2} \times 100\%$ 

LEAK PERCENT\*\*

LEAKER COUNT

6

ESTIMATED COMPONENT COUNT\*

1826

.32

Signature: Date: 23 August 2017

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

## Initial Site Photo

Location: Well Head

Date & Time: 8/22/2017 2:26:45 PM

Geolocation: N(b) (9)



## Camera Verification Photo

Location: GPU Stack

Date & Time: 8/22/2017 2:27:47 PM

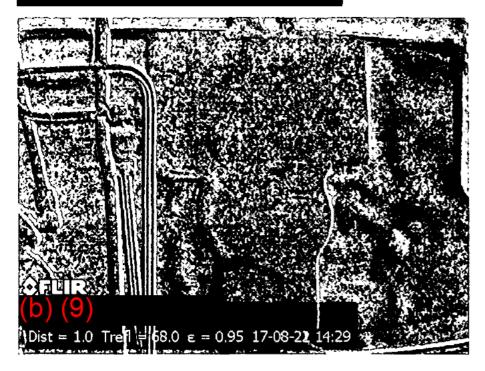


## THUN-20170822-001IR Leaking

Location: 6H GPU Run 2 Level Controller Pilot

Date & Time: 8/22/2017 2:29:49 PM

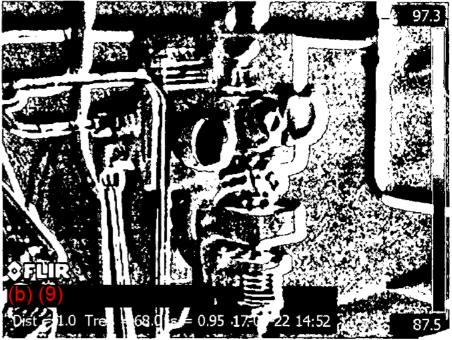
Geolocation: (b) (9)



## THUN-20170822-001IR Repaired

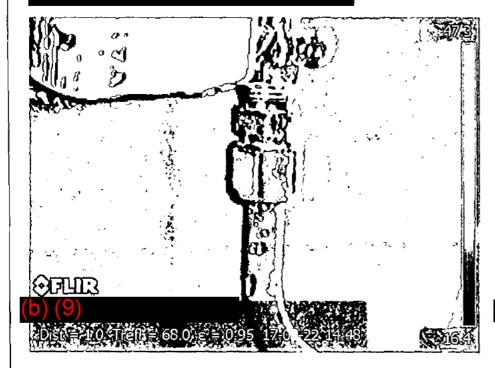
Location: 6H GPU Run 2 Level Controller Pilot

Date & Time: 8/22/2017 2:52:59 PM



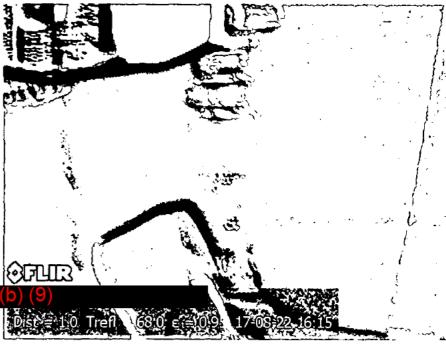
## THUN-20170822-002IR Leaking

4H GPU Run 1 Pilot Location: Date & Time: 8/22/2017 2:48:53 PM Geolocation: (b) (9)



## THUN-20170822-002IR Repaired

4H GPU Run 1 Pilot Location: Date & Time: 8/22/2017 4:15:20 PM Geolocation: (b) (9)

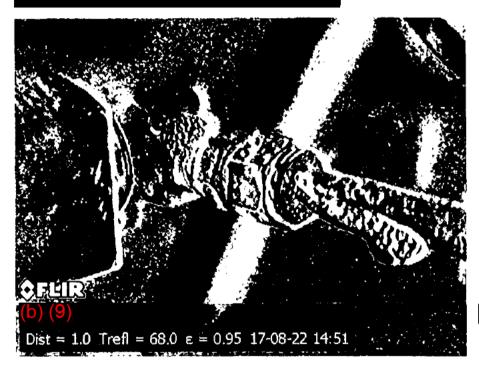


## THUN-20170822-003IR Leaking

Location: 4H GPU Run 2 Solenoid Stainless Fitting

Date & Time: 8/22/2017 2:51:26 PM

Geolocation: (b) (9)



## THUN-20170822-003IR Repaired

Location: 4H GPU Run 2 Solenoid Stainless Fitting

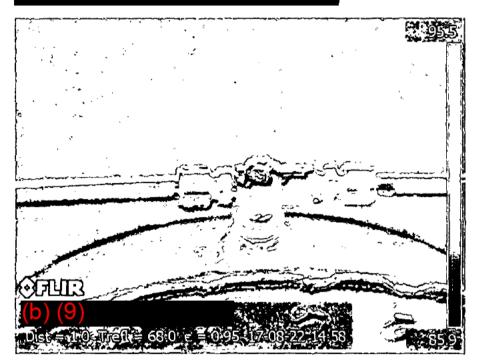
Date & Time: 8/22/2017 4:18:54 PM



## THUN-20170822-004IR Leaking

8H GPU Run 1 High- Low Quick Exhaust Location:

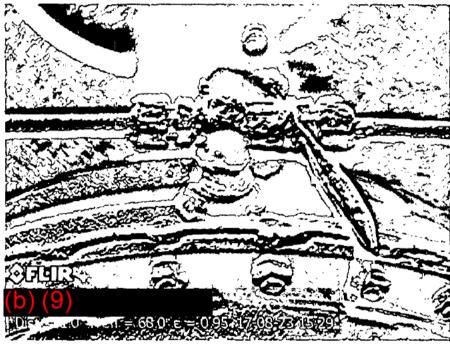
Date & Time: 8/22/2017 2:58:09 PM Geolocation: (b) (9)



## THUN-20170822-004IR Repaired

8H GPU Run 1 High- Low Quick Exhaust Location:

Date & Time: 8/23/2017 3:29:20 PM Geolocation: (b) (9)



#### THUN-20170822-005IR Leaking

Location: 2HA GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 3:53:48 PM

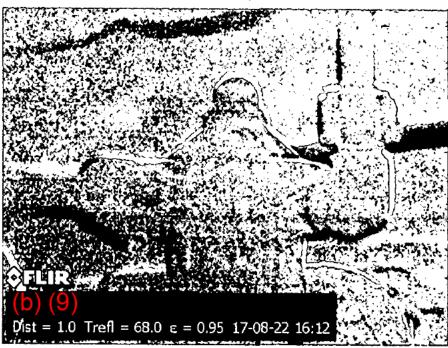
Geolocation: (b) (9)



#### THUN-20170822-005IR Repaired

Location: 2HA GPU Run 1 Stainless Fitting

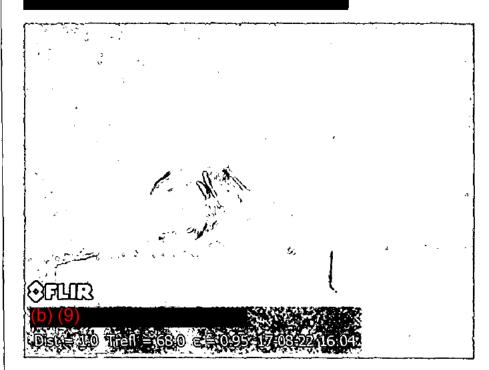
Date & Time: 8/22/2017 4:12:13 PM



## THUN-20170822-006IR Leaking

Location: 10HA GPU Run 1 Solenoid Stainless Fitting

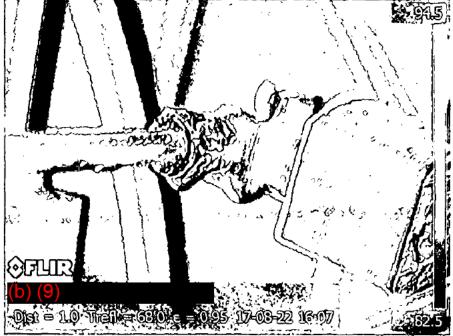
Date & Time: 8/22/2017 4:04:35 PM Geolocation: (b) (9)



## THUN-20170822-006IR Repaired

Location: 10HA GPU Run 1 Solenoid Stainless Fitting

Date & Time: 8/22/2017 4:07:12 PM Geolocation: (b) (9)





## Rice Drilling D LLC LDAR Inspection Conducted on August 22, 2017 Tuna Nut Well Pad 1H, 3H, 5H, 7H



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## Rice Drilling D LLC

Tuna Nut 1H, 3H, 5H, 7H Leaking Components Report

Inspection Conducted on 08/22/2017

	13
Total repairs not made within 30 days	0

Leak #	Location Description	Testing Method	Testing Equipment	Inspection Date	Final Repair Deadline	Repair Date	Corrective Action Description	OGI Retest Date	Repair confirmed with OG!?
TUNA-20170822-001	7H GPU Run 1 Supply to High- Low	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-002	7H GPU Run 1 Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-003	7H GPU Run 1 Pilot Gas Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-004	7H GPU Run 2 Fuel Supply Union	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-005	5H GPU Run 2 Solenoid Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YEŞ
TUNA-20170822-006	5H GPU Run 1 Solenoid Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-007	3H GPU Run 2 Fuel Supply Union	OG!	FLIR GF 320	8/22/2017	9/21/2017	E/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-008	3H GPU Run 2 Fuel Supply 1/2 Inch Nipple	OGI	FLIR GF 320	8/22/2017	9/21/2017	9/1/2017	1st Retaped	9/1/2017	YES
TUNA-20170822-009	3H GPU Run 2 Fuel Supply 1 Inch Nipple	OGI	FLIR GF 320	8/22/2017	9/21/2017	9/1/2017	1st Retaped	9/1/2017	YES
TUNA-20170822-010	3H GPU Run 1 Fuel Supply Gauge	ogi	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-011	1H GPU Run 2 Pilot Gas Stainless Fitting	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-012	1H GPU Run 2 Union	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES
TUNA-20170822-013	1H GPU Run 2 Union	OGI	FLIR GF 320	8/22/2017	9/21/2017	8/22/2017	1st Tightened	8/22/2017	YES

Inspection Personnel	OGI Certification Number
(b) (6)	163753



WELLPAD	Tuna Nut wellp	una Nut wellpad				
ON-SITE CONTACT	Jed Marshall		·			
DATE TESTED	8/22/2017	START TIME	1040	END TIME	1330	
SKY CONDITIONS	Cloudy	AMBIENT TEMP	80	WIND SPEED	13	

CAMERA MODEL	FLIR GF 320
CAMERA ID NUMBER	S/N: 44401600
CAMERA CERTIFICATION DATE	8 August 2016
DAILY VERIFICATION DATE	8/22/22017
MAXIMUM VIEWING DISTANCE	25 feet

MONITORING COMPANY	Premier Energy Services, LLC
MONITORING TECHNICIAN	(b) (6)
TECHNICIAN CERTIFIED? (Y/N)	YES
TECHNICIAN YEARS OF EXPERIENCE	2 Months

	LEAKS DETECTED (Attach additional sheets if necessary)				
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1	7H GPU Run 1 Supply to High- Low	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
2	7H GPU Run 1 Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	I <sup>st</sup> Tightened
3	7H GPU Run 1 Pilot Gas Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
4	7H GPU Run 2 Fuel Supply Union	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	l <sup>st</sup> Tightened
5	5H GPU Run 2 Solenoid Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
6	5H GPU Run 1 Solenoid Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	2
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (✓)	7
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	0
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (<)	<b>√</b>
ALL STILL IMAGES ARE DATED AND GIS ENABLED (*)	<u> </u>
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* ( > )	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	N/A

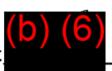
#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{Leak \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	13
ESTIMATED COMPONENT COUNT*	1073
LEAK PERCENT**	1.21

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator: estimated using Subpart Wipopulation count factors.

Signature:



Date: 22 Aug-s+ 2017

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.



LEAKS DETECTED (Attach additional sheets if necessary)					
Lo	ocation Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
7	3H GPU Run 2 Fuel Supply Union	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
×	3H GPU Run 2 Fuel Supply ½ Inch Nipple	8/22/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Retaped
ч .	3H GPU Run 2 Fuel Supply 1 Inch Nipple	8/22/2017	9/1/2017	FLIR GF 320 S/N: 44401600	1st Retaped
161	3H GPU Run 1 Fuel Supply Gauge	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
77	1H GPU Run 2 Pilot Gas Stainless Fitting	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
12	1H GPU Run 2 Union	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened
13	1H GPU Run 2 Union	8/22/2017	8/22/2017	FLIR GF 320 S/N: 44401600	1 <sup>st</sup> Tightened

#### Initial Site Photo

Location: Well Head

Date & Time: 8/22/2017 10:57:47 AM

Geolocation: (b) (9)



#### Camera Verification Photo

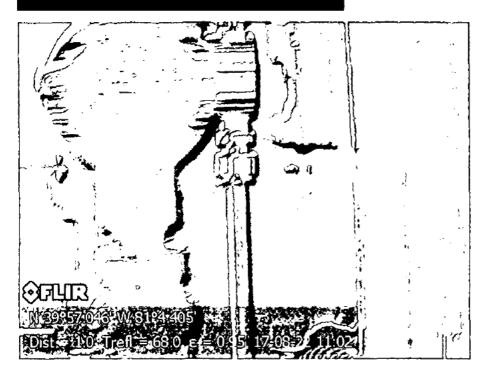
Location: GPU Stack

Date & Time: 8/22/2017 10:58:51 AM



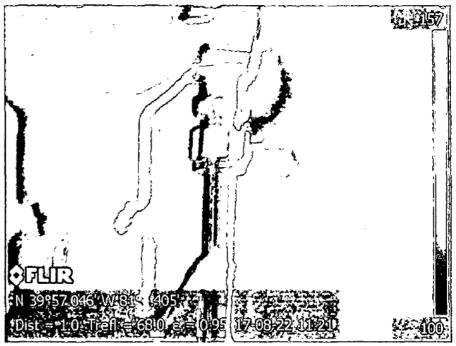
## TUNA-20170822-001IR Leaking

Location: 7H GPU Run 1 Supply to High-Low Date & Time: 8/22/2017 11:02:36 AM
Geolocation: (b) (9)



## TUNA-20170822-001IR Repaired

Location: 7H GPU Run 1 Supply to High-Low Date & Time: 8/22/2017 11:21:14 AM
Geolocation: (b) (9)



## TUNA-20170822-002IR Leaking

Location: 7H GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 11:07:29 AM

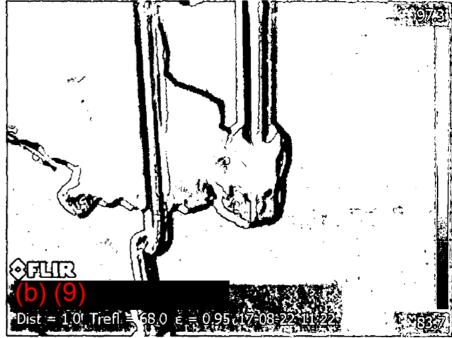
Geolocation: (b) (9)



## TUNA-20170822-002IR Repaired

Location: 7H GPU Run 1 Stainless Fitting

Date & Time: 8/22/2017 11:22:14 AM

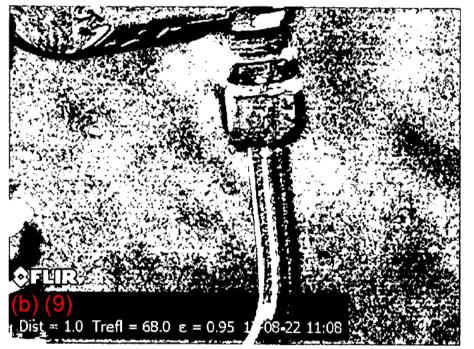


## TUNA-20170822-003IR Leaking

Location: 7H GPU Run 1 Pilot Gas Stainless Fitting

Date & Time: 8/22/2017 11:08:41 AM

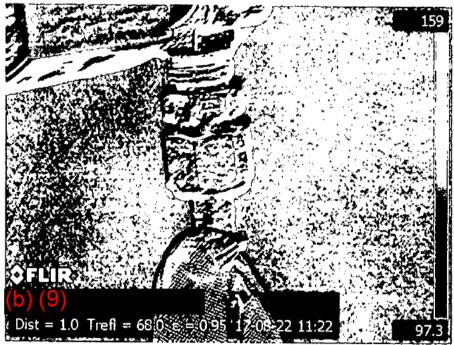
Geolocation: (b) (9)



## TUNA-20170822-003IR Repaired

Location: 7H GPU Run 1 Pilot Gas Stainless Fitting

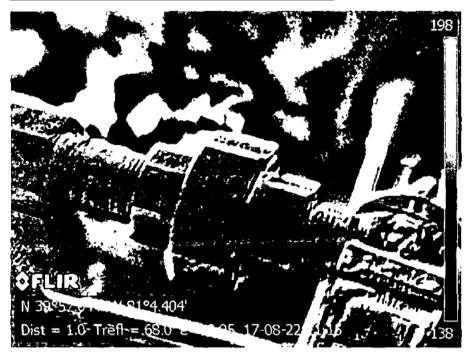
Date & Time: 8/22/2017 11:23:00 AM



#### TUNA-20170822-004IR Leaking

7H GPU Run 2 Fuel Supply Union Location:

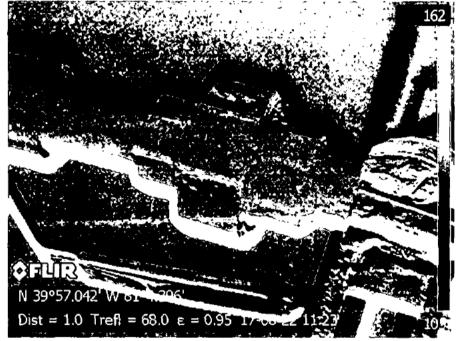
Date & Time: 8/22/2017 11:15:05 AM Geolocation: (b) (9)



## TUNA-20170822-004IR Repaired

7H GPU Run 2 Fuel Supply Union Location:

Date & Time: 8/22/2017 11:24:00 AM Geolocation: (b) (9)



## TUNA-20170822-005IR Leaking

Location: 5H GPU Run 2 Solenoid Stainless Fitting

Date & Time: 8/22/2017 11:30:33 AM

Geolocation: (b) (9)



#### TUNA-20170822-005IR Repaired

Location: 5H GPU Run 2 Solenoid Stainless Fitting

Date & Time: 8/22/2017 11:38:33 AM

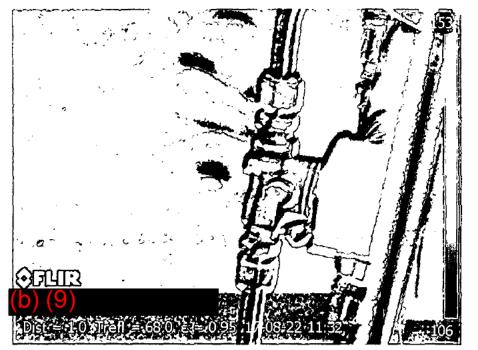


## TUNA-20170822-006IR Leaking

Location: 5H GPU Run | Solenoid Stainless Fitting

Date & Time: 8/22/2017 11:32:14 AM

Geolocation: (b) (9)



## TUNA-20170822-006IR Repaired

Location: 5H GPU Run 1 Solenoid Stainless Fitting

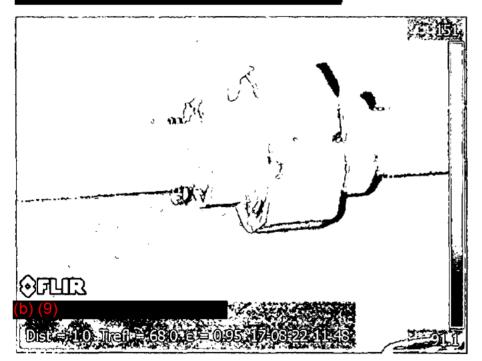
Date & Time: 8/22/2017 11:39:17 AM



## TUNA-20170822-007IR Leaking

3H GPU Run 2 Fuel Supply Union Location:

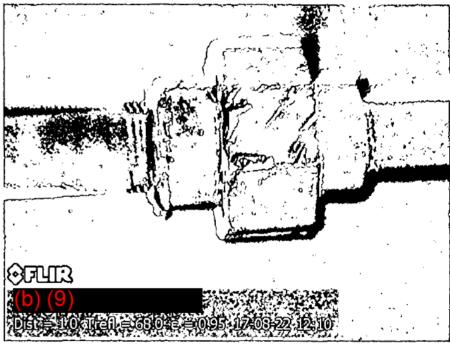
Date & Time: 8/22/2017 11:48:41 AM Geolocation: (b) (9)



## TUNA-20170822-007IR Repaired

3H GPU Run 2 Fuel Supply Union Location:

Date & Time: 8/22/2017 12:10:42 PM



## TUNA-20170822-008IR Leaking

Location: 3H GPU Run 2 Fuel Supply ½ Inch Nipple

Date & Time: 8/22/2017 11:50:34 AM

Geolocation: (b) (9) (b) (9)



## TUNA-20170822-0081R Repaired

Location: 3H GPU Run 2 Fuel Supply 1/2 Inch Nipple

Date & Time: 9/1/2017 8:29:27 AM



#### TUNA-20170822-009IR Leaking

3H GPU Run 2 Fuel Supply 1 Inch Nipple Location:

Date & Time: 8/22/2017 11:52:41 AM Geolocation: (b) (9)



## TUNA-20170822-009IR Repaired

Location: 3H GPU Run 2 Fuel Supply ½ Inch Nipple

Date & Time: 9/1/2017 8:30:18 AM Geolocation: (b) (9)



## TUNA-20170822-010IR Leaking

Location: 3H GPU Run 1 Fuel Supply Gauge

Date & Time: 8/22/2017 11:55:45 AM

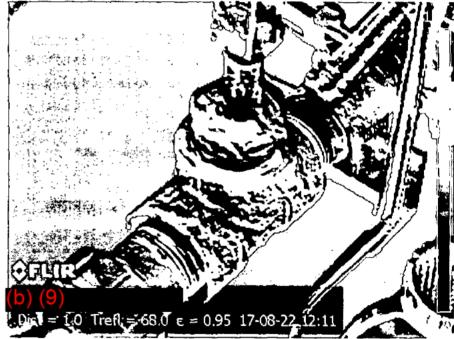
Geolocation: (b) (9)



## TUNA-20170822-010IR Repaired

Location: 3H GPU Run 1 Fuel Supply Gauge

Date & Time: 8/22/2017 12:11:30 PM



#### TUNA-20170822-011IR Leaking

1H GPU Run 2 Pilot Gas Stainless Fitting Location:

Date & Time: 8/22/2017 12:22:10 PM

Geolocation: (b) (9)



#### TUNA-20170822-011IR Repaired

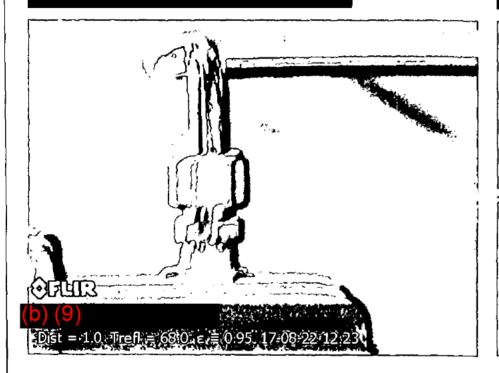
Location: 1H GPU Run 2 Pilot Gas Stainless Fitting
Date & Time: 8/22/2017 12:38:49 PM
Geolocation: (b) (9)



#### TUNA-20170822-012IR Leaking

Location: 1H GPU Run 2 Union Date & Time: 8/22/2017 12:23:10 PM

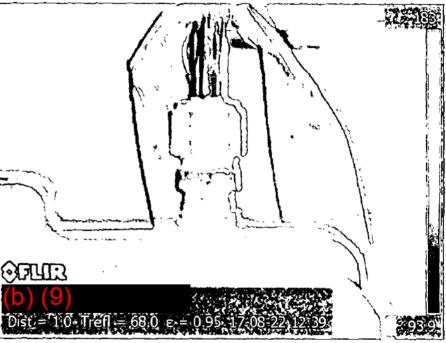
Geolocation: (b) (9)



### TUNA-20170822-012IR Repaired

Location: 1H GPU Run 2 Union
Date & Time: 8/22/2017 12:39:34 PM

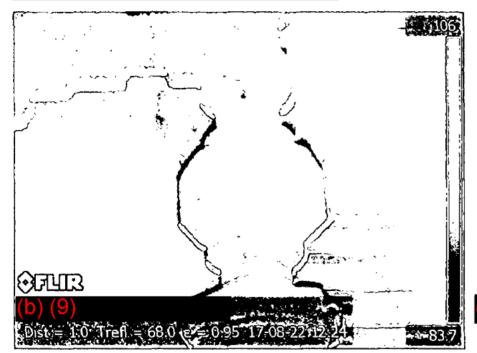
Geolocation: (b) (9



#### TUNA-20170822-013IR Leaking

1H GPU Run 2 Union Location: Date & Time: 8/22/2017 12:24:36 PM

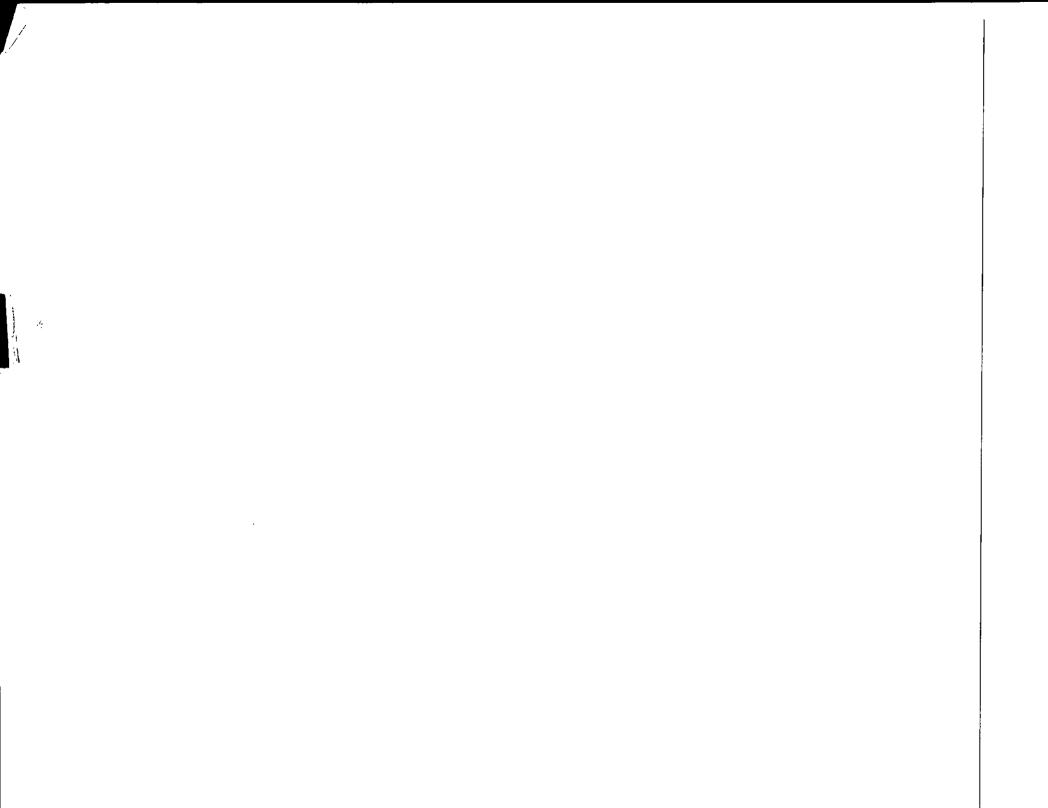
Geolocation: (b) (9)



#### TUNA-20170822-013IR Repaired

1H GPU Run 2 Union Location: Date & Time: 8/22/2017 12:40:21 PM Geolocation: (b) (9)





October 25, 2017

Ohio Environmental Protection Agency Division of Air Pollution Control Southeast District Office 2195 Front Street Logan, OH 43138

Re: S

Strike Force East, LLC

**NSPS Subpart OOOOa Annual Report** 

To whom it may concern:

Strike Force East, LLC (SFE) is submitting the attached report for NSPS Subpart OOOOa, as required by 40 CFR §60.5420a(b). This report contains the information specified in §60.5420a(b)(1), (b)(7), and (b)(8).

The report covers the period of August 2, 2016 through August 1, 2017.

Should you have any questions or comments about this submittal, please contact me at (412) 400-6887 or at kristin.ryan@riceenergy.com.

Sincerely,

Kristin Ryan

**Emissions Permitting Specialist** 

Rice Energy, Inc.

Cc:

Director, Air and Radiation Division

US Environmental Protection Agency, Region V

77 West Jackson Boulevard Chicago, IL 60604-3590

Enclosures



							•	•
 _	 			 	 		 	

# Strike Force East LLC NSPS Subpart OOOOa Annual Report

#### **General Information**

Company Name:

Strike Force East LLC

Address:

2200 Rice Drive

Canonsburg, PA 15317

Reportir	ng Period
Start Date	End Date
8/2/2016	8/1/2017

#### **Report Preparer**

Name:

Kristin Ryan

Title:

**Emissions Permitting Coordinator** 

Phone:

412-400-6887

Email:

kristin.ryan@riceenergy.com

#### **Certifying Official**

Name:

**Justin Trettel** 

Title:

VP of Midstream Operations and Engineering

Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature

10/25/2017 Date Rice Drilling B, LLC NSPS Subpart ODOGO Annual Report

Pneumatic Pump Affected Facilities

	_					Technically infeatible to	Emissions from the		
	_					cipture and route the	cipture and route the presumatic pump are routed		
		_	_		No control device or process; emissions to the control	emissions to the control	to a control device of	Records of Deviations	
		_		Number of	is available on site	device or process	process	Occuring During the	
Street Address	è	County	State	4	8	Z	æ	Reporting Period	Comments
( *	Powhatan Por	oint Belmont	H			×			PE certification attached
	St. Clairsville	Belmont	Ю	1		×			PE certification attached
	St. Clahrsville	Belmont:	푱	_		×			PE certification attached
(0	Jacobstrung	Belmont	НО	1		×			PE certification attached

Control Revies or process was mmoved and now test-including influenties to capare and rouns the emission to another control device or process. Control awker or process
was removed and now no
control/gencies is available en
on site New control device and technically intestable to capture and route the emissions to the control device (X) New control device and emissions are controlled<sup>1</sup>
(X) Pump to State County ŧ Street Address Well Site

Comments

Records of Deviations Occuring Owing the Reporting Period<sup>2</sup>

-If the control denice is designed to achieve less than 96 percent emissions reduction, specify the percent emissions reductions, the control device is designed to achieve.

\* As specified in 40 CFR 60 5-3204 (# 161/H)



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Charlie

911 ADDRESS



**COUNTY** 

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	November 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

Comments					
	 <u>-</u>		 	 	

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
  - b. Back-pressure on the diaphragm pump exhaust (~8-20 psig) can cause erratic stroke rate as the exhaust is configured to atmospheric conditions.
- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
  - a. No flame arrestor is currently installed to prevent backflash. Adding a flame arrestor in this application would result in varying degrees of backpressure continuously being held on the system. Also, a blockage could occur if exhaust system to burner is not properly maintained, resulting in erratic pump operation and excessive wear on internals, pump malfunction, or fire exposure.

"I certify that the assessment of technical infeasibility was prepared under my direction or supervision. I further certify that the assessment was conducted and this report was prepared pursuant to the requirements of §60.5393a(b)(5)(iii). Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Loty Boles

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

CORY A. HARRIS E-82396



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Dorsey

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	March 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED - Yes / No	No
GREENFIELD SITE – Yes / No	No

Comments				
	_	· · ·		 

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

auffer

Cory Harris, P.E.
Environmental Engineer
cory.harris@riceenergy.com
Phone: 724-271-7718

CORYA.
HARRIS
E-82396



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Snodgrass

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	June 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED – Yes / No	No
GREENFIELD SITE – Yes / No	No

Comments		

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com

<u>Phone</u>: 724-271-7638

CoopBar

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone; 724-271-7718

CORY A. HARRIS E-82396

110/25/1

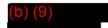


2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION Valerie

e <u>911 ADDRESS</u>



COUNTY

Beimont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	November 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED - Yes / No	No
GREENFIELD SITE - Yes / No	No

Comments		

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
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Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Colyppor

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Rhoneu 7,24-271-7718

CORY A. HARRIS

NAL.

# Strike Force East LLC NSPS Subpart OOOOa Annual Report

#### **Fugitive Components at Well Sites**

Well Site	Street Address	City	County	State	Date(s) of Monitoring Surveys
Charlie		Powhatan Point	Belmont	ОН	9/26/2017
Dorsey	101491	St. Clairsville	Belmont	ОН	9/26/2017
Snodgrass		St. Clairsville	Belmont	ОН	9/26/2017
Valerie		Jacobsburg	Belmont	ОН	9/25/2017



					14141	
STATION	CHARL	15				
ON-SITE CONTACT	J.C J		W			
DATE TESTED	9-26-17	1		12:20 Pm	END TIME	12: 45 PM
SKY CONDITIONS	CLEAR	AMBIENT	TEMP	850	WIND SPEED	12:45 PM
CAMERA MODEL		Gi	FX 320			+
CAMERA ID NUMBE	 R	Sì	749001	)2		
CAMERA CERTIFICA	TION DATE	2/	27/2017			. 78007
DAILY VERIFICATION	N DATE	(	7-26	-2017	•	
MAXIMUM VIEWING	DISTANCE		feet			
MONITORING COMP	ANY	RI	CE POSE	JDON MIDSTR	EAM	
MONITORING TECHN	NICIAN	(b	o) (6)			
TECHNICIAN CERTIF	IED? (Y/N)	YI	ES			, ma, m,
TECHNICIAN YEARS	OF EXPERIENC	CE	3 M	שמדעו		
	LEAKS DETEC	TED (Attac	h additi	onal sheets if	necessary)	
Location Description	Date Detected	Date Repaired	l l	amera Model ID for Rescan	Descriptio	/e Action n <u>For Each</u> empt
1						
2						-
3						
4						
5				_	*	
6						·
NUMBER OF COMPO	NENTS NOT RE	EPAIRED D	URING I	NITIAL SCAN	(#) \( \begin{picture}(100,0) \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	747-7
ALL UNREPAIRED CO					J/L	
NUMBER OF DIFFICU					0	ea <del>dar serve</del> er

NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)



AT LEAST ONE STILL IMAGE IS ATTACHED (<)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	NA
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	NA
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (*)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{a^k \times 100\%}{Count_{Est}}$ 

LEAKER COUNT		 	<u></u>	
ESTIMATED COMPONENT COUNT*		 		
LEAK PERCENT**		 		

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly

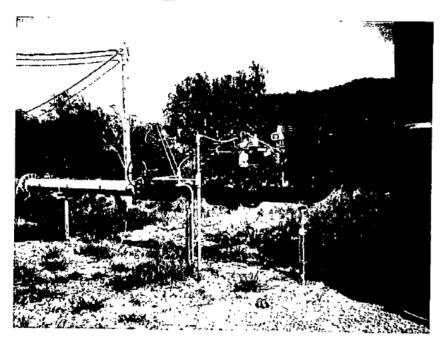
### LDAR Image Title Form





LOCATIO	ON /	CHARLIZ		NITIAL SITE PHOTO	DC_0134
TECHNIC		(6)		MERA VERIFICATION	IR_0135
DATE TE	STED	7-26-2	2017	РНОТО	<u> </u>
SD Card	* SANDI	SK 8 GL	8 OH10"	*3	
Leak	Date	L R	Digital	IR Picture	IR Movie
1					
2					
3					
4					
5					
6					
7					
8					

## **Initial Site Photo**



## **Camera Verification Photo**





STATION	DOCSEY					
ON-SITE CONTACT	J.C J	OYNSON	1			
	7-26-17	START TIME		1:50 PM	END TIME	3:20 PM
	CHEAR	AMBIENT TE		860	WIND SPEED	3:20" 3 MPH
CAMERA MODEL		GFX	320		1-11-0-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	
CAMERA ID NUMBER		SN 7	4900102			
CAMERA CERTIFICAT	ION DATE	2/27	/2017			
DAILY VERIFICATION	DATE	9-	-26-	2017		
MAXIMUM VIEWING D	ISTANCE	25 fe	et			
MONITORING COMPA	NY	RICE	POSEID	ON MIDSTR	EAM	
MONITORING TECHNI	CIAN	(b)	(6)			
TECHNICIAN CERTIFIE	ED? (Y/N)	YES				<del></del>
TECHNICIAN YEARS	F EXPERIEN	CE 3	mon	ITH'S		
L	EAKS DETEC	CTED (Attach	addition	al sheets if	necessary)	
Location Description	Date Detected	Date Repaired		era Model for Rescan	Description	ve Action on <i>For Each</i> empt
1						
2						
		·				

Location Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1				
2		·		
3				
4				
5		<del>-</del>		
6				

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (~)	NA
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	Q
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	$\Box$



AT LEAST ONE STILL IMAGE IS ATTACHED ( </th <th>V</th>	V
ALL STILL IMAGES ARE DATED AND GIS ENABLED ( )	V
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	NA
REPAIR STILL IMAGES ARE ATTACHED ( / or N/A)	NA
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{ak \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	
ESTIMATED COMPONENT COUNT*	
LEAK PERCENT**	

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature (b) (6) \_\_\_\_\_\_ Date: <u>Y-26-2017</u>

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

## LDAR Image Title Form

Complete one (1) form per wellpad or compressor station.

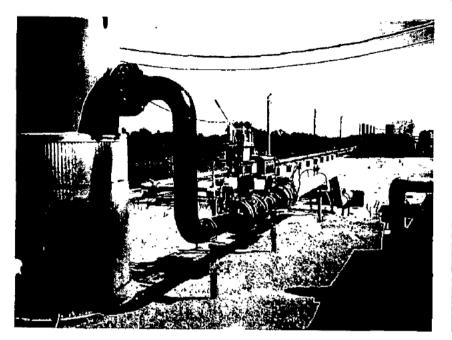


LOCATION	DORSEY	INITIAL SITE PHOTO	DC_0137
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_0136
DATE TESTED	9-26-2017		

1			
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Leak	Date	L	R	Digital	IR Picture	IR Movie
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## **Initial Site Photo**



## **Camera Verification Photo**





STATION	SNODGRASS				
ON-SITE CONTACT	J.C. JO				
DATE TESTED	9-26-17	START TIME	2:40	END TIME	3:05
SKY CONDITIONS	CLEAR	AMBIENT TE	MP 86	WIND SPEED	3:05
CAMERA MODEL		GFX	320		
CAMERA ID NUMBER	}	SN 7	1900102		
CAMERA CERTIFICA	TION DATE	2/27/	2017		
DAILY VERIFICATION	DATE	9	-26-201	7	_
MAXIMUM VIEWING	DISTANCE	25 fee	et .	-	
MONITORING COMPA	ANY	RICE	POSEIDON MID	STREAM	
MONITORING TECHN	ICIAN	(b) (	6)		
TECHNICIAN CERTIF	ED? (Y/N)	YES			
TECHNICIAN YEARS	OF EXPERIENC	CE 3	MOUTHS	1444444	
	L FAKS DETEC		additional sheets	e if noraceam)	
	Date	Date	Camera Mod	Correctiv	ve Action
Location Description	Detected	Repaired	and ID for Res	Descriptio	n <u>For Each</u> empt
2					
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		PAIRED DUR	ING INITIAL SC	AN (#)	
NUMBER OF COMPO	NENTS NOT RE	I AINLU DON			,
ALL UNREPAIRED CO				NI	A
	MPONENTS H	AVE BEEN TA	AGGED (1)	N	<i>A</i>

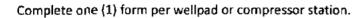


AT LEAST ONE STILL IMAGE IS ATTACHED (~)					
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1)					
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)					
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	NA				
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)					
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NIA				
*If either plan or path were not followed, please include a written description and expla	nation with this form.				
ADDITIONAL OHIO CALCULATION:					
$Leak\% = \frac{ak \times 100\%}{c}$					
Count <sub>Est</sub>					
LEAKER COUNT					
ESTIMATED COMPONENT COUNT*					
LEAK PERCENT**					

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

## LDAR Image Title Form



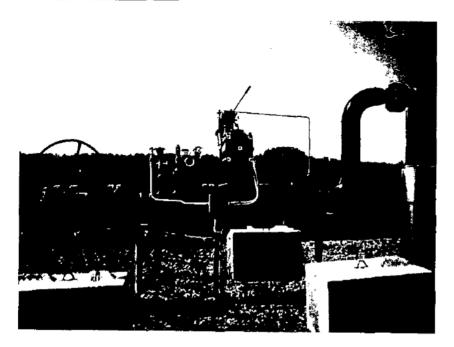


LOCATION	SNODGRASS	INITIAL SITE PHOTO	DC_	0139
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_	0138
DATE TESTED	9-26-2017			

	·		
000 4 #		$\theta \sim 1$	
SD Card #	CALINICA	· X & D	0410 3
	SANDISH	-00n	
		· ·	

Leak	Date	L R	Digital	IR Picture	IR Movie
1					
2					
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4					
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6					
7					
8			•		

## **Initial Site Photo**



## **Camera Verification Photo**





_				RICE	IERGY
STATION	VALERIE	٤			
ON-SITE CONTACT	SHANE	MURRAY			
DATE TESTED	9-25-17	START TIME	12:45 PM	END TIME	1.15
SKY CONDITIONS	CLEAR	AMBIENT TEN		WIND SPEED	3 MEN
CAMERA MODEL		GFX 32	20		
CAMERA ID NUMBER SN 74900102					
CAMERA CERTIFICA	TION DATE	2/27/20	)17		
DAILY VERIFICATION	DATE	9-	25-2017	1	
MAXIMUM VIEWING	DISTANCE	25 feet		According to the second second	
MONITORING COMPA	ANY	RICE P	OSEIDON MIDSTR	EAM	
MONITORING TECHN	ICIAN	(b) (6)		-	
TECHNICIAN CERTIF	IED? (Y/N)	YES		-	
TECHNICIAN YEARS	OF EXPERIEN	CE 3/	צודעס		
	LEAKS DETEC	,	ditional sheets if	necessary)	
Location Description	Detected		Camera Model and ID for Rescan	Descriptio	re Action n <u>For Each</u> empt
1 FILTER SHAMES	9-25-17		SFX 320 N 74900107	TIGHTENEO	PHINS
2					
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NUMBER OF COMPO	NENTS NOT RI	EPAIRED DURIN	IG INITIAL SCAN	(#)	<del></del>
ALL UNREPAIRED CO	MPONENTS H	IAVE BEEN TAC	 GED (/)	1114	<u> </u>

NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)

NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)



AT LEAST ONE STILL IMAGE IS ATTACHED (V)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (*)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (*)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NIA
*If either plan or path were not followed, please include a written description and explanation	nation with this form.
ADDITIONAL OHIO CALCULATION:	
$Leak\% = \frac{ak \times 100\%}{}$	
Count <sub>Est</sub>	
LEAKER COUNT	
ESTIMATED COMPONENT COUNT*	
I FAK DERCENT**	

Signature (b) (6) - Date: <u>9-25-2017</u>

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly

### **LDAR Image Title Form**

Complete one (1) form per wellpad or compressor station.

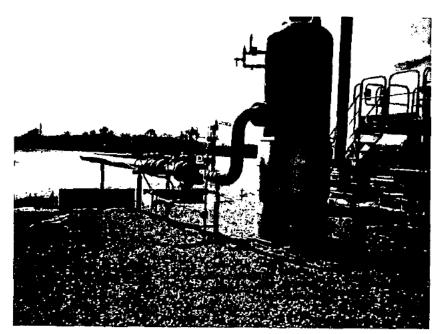


LOCATION	VALERIE	INITIAL SITE PHOTO	DC_0096
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_ 0097
DATE TESTED	9-25-2017		

SD Card# SANDISK 86B OHIO# 2

Leak	Date	L F	R Digital	IR Picture	IR Movie
1	9-25-2017		DC_0099	IR_0098	MOV_ 0100
	9-25-2017	R	DC_010Z	IR_ 0101	MOV. 0103
2		1			
3	-				
4					
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8 -	AA.				

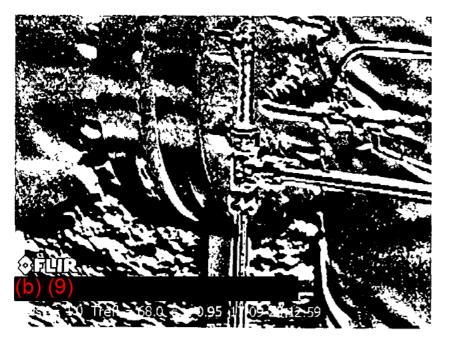
## **Initial Site Photo**



### **Camera Verification Photo**



## Filter Separator Supply Line Leak



## Filter Separator Supply Line Repair



October 25, 2017

Ohio Environmental Protection Agency Division of Air Pollution Control Southeast District Office 2195 Front Street Logan, OH 43138

Re:

Strike Force South, LLC

**NSPS Subpart OOOOa Annual Report** 

To whom it may concern:

Strike Force South, LLC (SFS) is submitting the attached report for NSPS Subpart OOOOa, as required by 40 CFR §60.5420a(b). This report contains the information specified in §60.5420a(b)(1), (b)(7), and (b)(8).

The report covers the period of August 2, 2016 through August 1, 2017.

Should you have any questions or comments about this submittal, please contact me at (412) 400-6887 or at kristin.ryan@riceenergy.com.

Sincerely,

Kristin Ryan

**Emissions Permitting Specialist** 

Rice Energy, Inc.

Cc:

Director, Air and Radiation Division

US Environmental Protection Agency, Region V 77 West Jackson Boulevard

Chicago, IL 60604-3590

**Enclosures** 



# Strike Force South LLC NSPS Subpart OOOOa Annual Report

#### **General Information**

**Company Name:** 

Strike Force South LLC

Address:

2200 Rice Drive

Canonsburg, PA 15317

Reporting Period				
Start Date End Date				
8/2/2016	8/1/2017			

#### **Report Preparer**

Name:

Kristín Ryan

Title:

**Emissions Permitting Coordinator** 

Phone:

412-400-6887

Email:

kristin.ryan@riceenergy.com

**Certifying Official** 

Name:

Justin Trettel

Title:

VP of Midstream Operations and Engineering

Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature

10/25/20/7 Date

### Rice Origing 8, LLC NSPS Subpart COOOa Annual Report

#### Pneumatic Pump Affected Facilities

Pagumatic Pumps Co	neumatic Pumps Constructed, Modified, or Reconstructed Ouring the Reporting Period;									
	i <del>-</del>			_			Technically infessible to	Emissions from the		
			l		1	l 1	capture and route the	pneumatic pump are routed		1 1
					l	No control device or process	emissions to the control	to a control device or	Records of Deviations	1
1	1	)	1	1	Number of	is avaliable on site	device or process	process'	Occuring During the	1 1
Well Site	Street Address	City	County	State	Pumps	(X)	(X)	(x)	Reporting Period <sup>2</sup>	Comments
Świtz 5		Bealisville	Belmont	ОН	1		. х			PE certification attached
Switz 16		Clarington	Selmont	ОН	11			T		PE certification attached
Donato		Graysville	Belmont	OH.	L.		x			PE certification attached
Gary Green		Graysville	Belmont	OH	1_		К			PE certification attached
lacebs		Woodsfield	Belrogot	OHL	1		Х			PE certification attached
Rick Martel		Graysville	Beimont	011	1. 1		×			PE certification attached
Roger W. Brown		Woodsfield	Belmont	OH	1		X			PE cartification attached
Tito Santana		Graysville	Belmont	OH	1		X			PE certification attached

Pneumatic Pumps Pri	eviously Reported and For Whith a Ch	ange in the Repo	red Conditio	n Changed !	Ourleg the Rep	orting Period:					
					.—				Control device or process	_	
1 1	i	1	i			i	New control device and		was removed and now		
1 1	·	<b>\</b>	1 '		\	i '	technically infeasible to	Control device or process	technically infeasible to		ı 1
1			l i		ļ		capture and route the	was removed and new no	capture and route the		j l
						New control device and	emissions to the control	control/process is available	emissions to another control	Records of Deviations	
		l	!		l	emissions are controlled	daylog	on site	device or process	Occuring During the	. 1
Well Site	Street Address	City	County	State	Pump ID	(X)	(X)	(X)	(x)	Reporting Period <sup>2</sup>	Comments
N/A											

<sup>1</sup> If the control device is designed to achieve less than 95 percent emissions reduction, specify the percent amissions reductions the control device is designed to achieve.

As specified in 40 CFR 60.5420a(c)(16)(ii).



2200 Rice Drive Canonsburg, PA 15317

#### Diaphragm Pumps

LOCATION

Switz 5

911 ADDRESS

(b) (9)

COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1		
INSTALLED ON	July 2017		
APPLICATION	Glycol transfer pump on storage tank		
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation		
ROUTED TO PROCESS - Yes / No	No		
CONTROLLED - Yes / Nó.	No		
GREENFIELD SITE - Yes No	No		

Comments

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
  - b. Back-pressure on the diaphragm pump exhaust (~8-20 psig) can cause erratic stroke rate as the exhaust is configured to atmospheric conditions.
- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
  - a. No flame arrestor is currently installed to prevent backflash. Adding a flame arrestor in this application would result in varying degrees of backpressure continuously being held on the system. Also, a blockage could occur if exhaust system to burner is not properly maintained, resulting in erratic pump operation and excessive wear on internals, pump malfunction, or fire exposure.

"I certify that the assessment of technical infeasibility was prepared under my direction or supervision. I further certify that the assessment was conducted and this report was prepared pursuant to the requirements of §60.5393a(b)(5)(iii). Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Environmental Engineer cory.harris@riceenergy.com
Phone: 724-2771-7718

Cory Harris, P.E.

HARRIS

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Colffee



Canonsburg, PA 15317

40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Switz 16

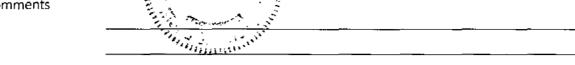
911 ADDRESS

COUNTY

Belmont (OH)

1
July 2017
Glycol transfer pump on storage tank
Yes – see documentation
No
No
No

Comments



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Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Coffee

Cory Harris, P.E.
Environmental Engineer
cory.harris@riceenergy.com
Phone: 724-271-7718

E OF DAIL

CORYA HARRIS E-82396

SFS SWITZ 16



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Donato

911 ADDRESS



<u>COUNTY</u>

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1_
INSTALLED ON	April 2017
APPLICATION ,	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS - Yes / No	No
CONTROLLED - Yes / No -	No
GREENFIELD SITE - Yes / No	No
The Marian Committee of the Committee of	

Comments

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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cody.baker@riceenergy.com
Phone: 724-271-7638

Cochfor

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

SONAL



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Gary Green

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	May 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROELED - Yes / No	No
GREENFIEED SITE #Yes / No	No

Comments	,	
COMMICHES	· · · · · · · · · · · · · · · · · · ·	
	<u> </u>	

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Colphater

Phone: 724-271-7638

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

E-82396

SFS GARY GREEN



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Jacobs

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	April 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED - Yes / No	No
GREENFIELD SITE - Yes / No	No

5

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CHBREN

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724<sub>1</sub>271-7718

CORY A. HARRIS E-82396

SFS JACOBS



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION Roger W. Brown 911 ADDRESS

(b) (9)

COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	April 2017
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation
ROUTED TO PROCESS - Yes / No	No
CONTROLLED - Yes / No	No
GREENFIELD SITE - Yes / No	No

Comments	• •		
	 <u> </u>	 	 

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Phone: 724-271-7638

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724<sub>k</sub>271-7718

CORYA. HARRIS E-82396

CodyBater



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Rick Martel

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	July 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED - Yes / No. :	No
GREENFIELD SITE - Yes / No	No

Comments				
	1 .			

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Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Coffee

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone 724-271-7718

10/25



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

#### Diaphragm Pumps

LOCATION

Tito Santana

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1	
INSTALLED ON	February 2016	
APPLICATION	Glycol transfer pump on storage tank	
IN USE FOR < 90 DAYS? – Yes / No	Yes – see documentation	
ROUTED TO PROCESS – Yes / No	No	
CONTROLLED – Yes / No	No	
GREENFIELD SITE - Yes / No	No	

Comments			
	 	 	<del>-</del> ·

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
  - b. Back-pressure on the diaphragm pump exhaust (~8-20 psig) can cause erratic stroke rate as the exhaust is configured to atmospheric conditions.
- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
  - a. No flame arrestor is currently installed to prevent backflash. Adding a flame arrestor in this application would result in varying degrees of backpressure continuously being held on the system. Also, a blockage could occur if exhaust system to burner is not properly maintained, resulting in erratic pump operation and excessive wear on internals, pump malfunction, or fire exposure.

"I certify that the assessment of technical infeasibility was prepared under my direction or supervision. I further certify that the assessment was conducted and this report was prepared pursuant to the requirements of  $\S60.5393a(b)(5)(iii)$ . Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Coupsity

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com Phone: 724-271-7718

CORY A. HARRIS E-82396

SFS TITO SANTANA

# Strike Force South LLC NSPS Subpart OOOOa Annual Report

### **Fugitive Components at Well Sites**

Well Site	Street Address	City	County	State	Date(s) of Monitoring Surveys
Switz 5		Beallsville	Belmont	ОН	9/25/2017
Switz 16	IDIIII	Clarington	Belmont	ОН	9/25/2017
Donato		Graysville	Belmont	ОН	9/27/2017
Gary Green		Graysville	Belmont	ОН	9/27/2017
Jacobs		Woodsfield	Belmont	ОН	9/27/2017
Rick Martel		Graysville	Belmont	ОН	9/27/2017
Roger W. Brown		Woodsfield	Belmont	ОН	9/27/2017
Tito Santana		Graysville	Belmont	ОН	9/27/2017



STATION	54172	<i>yy</i> 5			
ON-SITE CONTACT		MURRETY	,		
DATE TESTED	9:25-17		11:00	END TIME	11:25 A
SKY CONDITIONS	CLEAR	AMBIENT TEMP	750	WIND SPEED	11:25 A
CAMERA MODEL		GFX 320			
CAMERA ID NUMBER		SN 74900	0102		
CAMERA CERTIFICA	TION DATE	2/27/201	7		
DAILY VERIFICATION	DATE	9-25 25 feet	-17		
MAXIMUM VIEWING	DISTANCE	25 feet			
MONITORING COMPA	NY	RICE PO	SEIDON MIDSTR	EAM	
MONITORING TECHN	ICIAN	(b) (9)			
TECHNICIAN CERTIF	IED? (Y/N)	YES			
TECHNICIAN YEARS	OF EXPERIENC	E 3 m	ONTHS		
	LEAKS DETEC	TED (Attach add	itional sheets if	necessary)	
Location Description	Date Detected	l l	Camera Model Id ID for Rescar	Description	ve Action on <u>For Each</u> empt
1		-			
2					
3					
4					
5					
6					
NUMBER OF COMPO	NENTS NOT RE	PAIRED DURING	INITIAL SCAN	(#)	
ALL UNREPAIRED CO	MPONENTS H	AVE BEEN TAGO	GED (✓)	NIA	7
NUMBER OF DIFFICU	LT-TO-MONITO	R COMPONENT	S SCANNED (#)	7	

NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)



AT LEAST ONE STILL IMAGE IS ATTACHED (V)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (*)	
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	MA
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	NA
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (*)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{ak \times 100\%}{Count_{Est}}$ 

#### **LEAKER COUNT**

#### **ESTIMATED COMPONENT COUNT\***

#### LEAK PERCENT\*\*

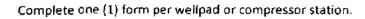
Signatur (6) \_\_Date: <u>9-25-2017</u>

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

# LDAR Image Title Form





LOCATION	54112#5	INITIAL SITE PHOTO	DC_0089
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_0090
DATE TESTED	9-25-2017		

j			٠
1	SD Card #	ANDISK 8GB	מנאס 1
٠	<u></u>	7.50.5	

<b>i</b>

# **Initial Site Photo**



# **Camera Verification Photo**





STATION 511172 16								
ON-SITE CONTACT SHANE MURRAY								
DATE TESTED	9-25-17	START	_	/1:35 A	END TIME	12:05		
SKY CONDITIONS	CLEAR	AMBIEN	NT TEMP		WIND SPEED	3 MAH		
CAMERA MODEL	GFX 320		<del></del>					
CAMERA ID NUMBER			SN 74900	102				
CAMERA CERTIFICAT	ION DATE		2/27/201	7				
DAILY VERIFICATION	DATE		9-6	15-2017	7			
MAXIMUM VIEWING D	ISTANCE		25 feet					
MONITORING COMPA	NY		RICE PO	SEIDON MIDSTR	EAM			
MONITORING TECHNI	CIAN		(b) (6)					
TECHNICIAN CERTIFI	ED? (Y/N)		YES					
TECHNICIAN YEARS	OF EXPERIENCE	CE	3 m	ovms		1		
	EAKS DETEC	TED (Att	ach add	itional sheets if	necessary)			
Location Description	Date Detected	Date Repair	red ar	Camera Model ad ID for Rescan	Descriptio Atte	ve Action on <u>For Each</u> empt		
1 RESERVED OF THE SEPTEMBER	9-25-17	9-26	-1750	SFX 320 1 7490010	115 ALLO DU	REAGUETE		
2			Į.			1		
	<del> </del>							
3								
3								
_								
4								
5	IENTS NOT RI	EPAIRED	DURING	S INITIAL SCAN	(#)			
4 5 6					(#)			
4 5 6 NUMBER OF COMPON	MPONENTS H	IAVE BEI	EN TAGO	SED (√)	(#) /			

RICE	
RICEPENERGY	

	/
AT LEAST ONE STILL IMAGE IS ATTACHED ( </th <td></td>	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	MA

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{^{ak} \times 100\%}{Count_{Est}}$ 

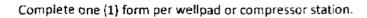
LEAKER COUNT	
ESTIMATED COMPONENT COUNT*	
LEAK PERCENT**	

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature (b) (6) \_\_\_\_\_\_ Date: 9-26-2017

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

### LDAR Image Title Form



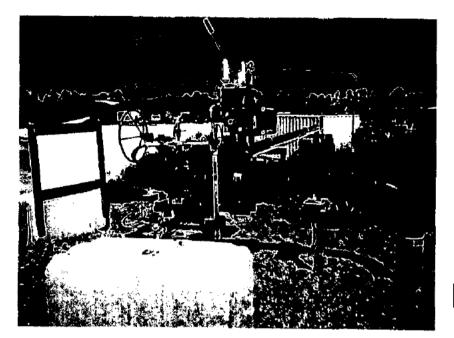


LOCATION	90172 16	INITIAL SITE PHOTO	DC_0091
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_ 009Z
DATE TESTED	9-25-2017		

SD Card# SANDISH 868 OHIO 1

Leak	Date	L R	Digital	IR Picture	IR Movie
1	9-25-2017	۷	DC_0093	IR_0094	MOV_ 0095
	9-26-2017	R	DC-0116	IR_0117	MOV_ 0118
2		<u> </u> 			
3					
4					
5					
6					
7					
8					

### **Initial Site Photo**



# **Camera Verification Photo**



### Flash Separator Back Pressure Regulator Leak



Flash Separator Back Pressure Regulator Repair





STATION	DONATO					
ON-SITE CONTACT	BRIAN	LEMAS	TERS			
DATE TESTED	9-21-17	START T		10:30	END TIME	1
SKY CONDITIONS	CLEAR	AMBIENT	TEMP	8/°	WIND SPEED	3 mod
CAMERA MODEL		G	FX 320			
CAMERA ID NUMBER	₹	S	N 7490010	2		
CAMERA CERTIFICA	TION DATE	2	/27/2017			
DAILY VERIFICATION	N DATE		9-27-	2017		
MAXIMUM VIEWING	DISTANCE	2.5	feet			
MONITORING COMP	ANY	R	ICE POSE	IDON MIDSTRI	EAM	
MONITORING TECHN	IICIAN	(t	(6)			
TECHNICIAN CERTIF	IED? (Y/N)	Y	ES			
TECHNICIAN YEARS	OF EXPERIENC	CE	3 m	NTH'S		
1	LEAKS DETEC	TED (Atta	ch additio	onal sheets if r	necessary)	
Location Description	Date Detected	Date Repaire		mera Model ID for Rescan	Dogorintia	re Action n <u>For Each</u> mpt
1						<u> </u>
2						
3	į					
4						
5						
6						
NUMBER OF COMPO	NENTS NOT RE	EPAIRED [	URING I	NITIAL SCAN (	#)	
ALL UNREPAIRED CO	OMPONENTS H	AVE BEEN	I TAGGE	D (✓)	NA	
NUMBER OF DIFFICU	LT-TO-MONITO	OR COMPO	NENTS :	SCANNED (#)	0	
NUMBER OF LINGAE	TO MONITOR	COMPON	ENTS SC	ANNED (#)	$\wedge$	



AT LEAST ONE STILL IMAGE IS ATTACHED ( )	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (*)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	NA
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	MA_
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (~)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA
*If either plan or path were not followed, please include a written description and explanation	anation with this form

#### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{ak \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	N/A - Only applicable for OH GP12.1 permits
ESTIMATED COMPONENT COUNT*	N/A - Only applicable for OH GP12.1 permits
LEAK PERCENT**	N/A - Only applicable for OH GP12.1 permits

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature: (b) (6) Date: 9-27-2017

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

# LDAR Image Title Form

Complete one (1) form per wellpad or compressor station.

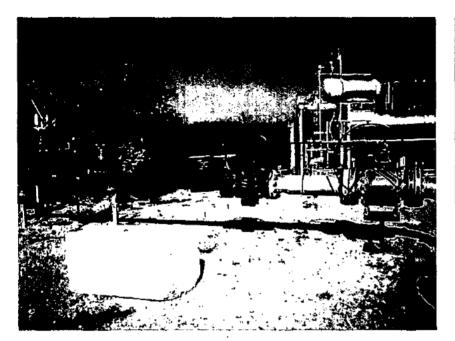


LOCATION	DONATO	INITIAL SITE PHOTO	ac_	0150
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	ZR-	0151
DATE TESTED	9-27-2017			

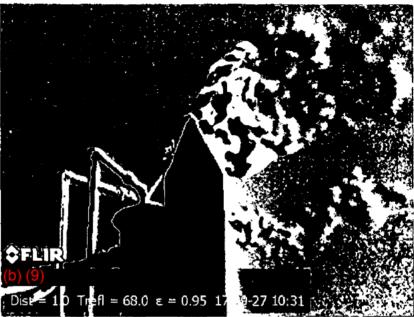
١			<del></del>			<u> </u>
	SD Card #	، بروان در س	72	00	- 11/10 TH	1
ı	SD Cald #	SANDISK	. X	GB	OHIO	
J						

Date	L R	Digital	IR Picture	IR Movie
		-		
	Date	Date L R	Date L R Digital	

# **Initial Site Photo**



# **Camera Verification Photo**





STATION	GARY G	REEN			
ON-SITE CONTACT		LEMASTE	res		
DATE TESTED	9-27-17	START TIME	11:55 BM	END TIME	12:20 PM
SKY CONDITIONS	CLEAR	AMBIENT TEN		WIND SPEED	12:20 AM
CAMERA MODEL		GFX 32	20		
CAMERA ID NUMBER		SN 749	00102		
CAMERA CERTIFICAT	TION DATE	2/27/20	017		
DAILY VERIFICATION	DATE	9-6	27-2017		
MAXIMUM VIEWING D	ISTANCE	25 feet			
MONITORING COMPA	.NY	RICEP	OSEIDON MIDSTRI	EAM	
MONITORING TECHNI	CIAN	(b) (6			
TECHNICIAN CERTIFI	ED? (Y/N)	YES	4		
TECHNICIAN YEARS		CE   7/	DONTHS		
			ditional sheets if		ve Action
Location Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Descriptio	n <u>For Each</u> empt
		I			
1					
1 2					
2					
3					
3 4					
2 3 4 5	NENTS NOT RE	EPAIRED DURIN	VG INITIAL SCAN (	#) E	
2 3 4 5 6				#) E	4
2 3 4 5 6 NUMBER OF COMPON	MPONENTS H	AVE BEEN TAC	GGED (✓)	#) E	4

LEAK PERCENT\*\*



AT LEAST ONE STILL IMAGE IS ATTACHED ( )	
ALL STILL IMAGES ARE DATED AND GIS ENABLED ( )	
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	NA
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	NA
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* ( )	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA
*If either plan or path were not followed, please include a written description and ex	planation with this form.
ADDITIONAL OHIO CALCULATION:	
$Leak\% = \frac{ak \times 100\%}{}$	
Count <sub>Est</sub>	
LEAKER COUNT	
ESTIMATED COMPONENT COUNTS	

Signature: (b) (6)

Date: 9-27-2017

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

### **LDAR** Image Title Form

Complete one (1) form per wellpad or compressor station.

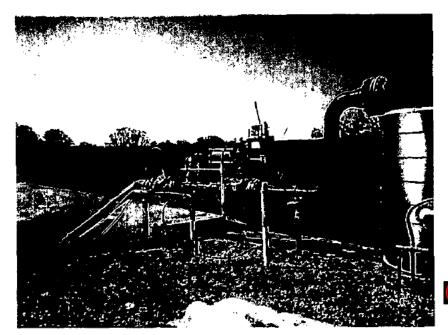


LOCATION	GARY GREEN	INITIAL SITE PHOTO	DC_ 0161	
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_ 0160	
DATE TESTED	9-27-2017			

SD Card# SANOISK 868 OHIO#2

Leak	Date	L R	Digital	IR Picture	IR Movie
1		-			
2					
3					
4					
5			,		
6					
7					
8					

### Initial Site Photo



### **Camera Verification Photo**





S1	ATION	JACOB	35						
01	N-SITE CONTACT	BRIAN.	KEMASI	ze s					
F_			START TIM	_	11:10 AM	END TIME	11:35 AM		
SKY CONDITIONS CLEAR		CLEAR	AMBIENT TEMP		820	WIND SPEED	3 MPH		
C	MERA MODEL		GFX	GFX 320					
CA	MERA ID NUMBER	₹	SN 7	SN 74900102					
C/	MERA CERTIFICA	TION DATE	2/27	2/27/2017					
D/	ILY VERIFICATION	N DATE	9-	27.	2017				
M	XIMUM VIEWING	DISTANCE	25 fe	et					
M	ONITORING COMP	ANY	RICI	RICE POSEIDON MIDSTREAM					
M	NITORING TECHN	IICIAN	(b) (	<b>(6</b> )					
TE	CHNICIAN CERTIF	IED? (Y/N)	YES	<del></del>	<del></del>				
TE	CHNICIAN YEARS	OF EXPERIEN	CE 3	mo	NTHS				
_		LEAKS DETEC				ecossary)			
Location Description Date		Date Repaired	Car	mera Model D for Rescan	Correcti Descriptio	Corrective Action Description For Each Attempt			
1	FUEL SUPPLY	9-22-17	9-27-17	OFX	320 74900102	RE-TAPED & T	SONTENED PLU		
2		1							
3			<u> </u>						
4									
5									
6									
NU	MBER OF COMPO	NENTS NOT RE	EPAIRED DU	RING IN	IITIAL SCAN (	#)	)		
AL	L UNREPAIRED CO	OMPONENTS H	AVE BEEN T	AGGE	) (<)	NI	]		
						<u> </u>			
NU	MBER OF DIFFICU	ILT-TO-MONIT	OR COMPON	ENTS S	CANNED (#)	(')			



		AT LEAST ONE STILL IMAGE IS ATTACHED (✓)
		ALL STILL IMAGES ARE DATED AND GIS ENABLED (1)
	V	LEAKER STILL IMAGES ARE ATTACHED ( or N/A)
		REPAIR STILL IMAGES ARE ATTACHED ( or N/A)
	1	MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)
	NIA	DELAY OF REPAIR FORMS COMPLETE ( or N/A)
-	N/A	MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)

### **ADDITIONAL OHIO CALCULATION:**

 $Leak\% = \frac{a^k \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	N/A - Only applicable to OH GP12.1 permits
ESTIMATED COMPONENT COUNT*	N/A - Only applicable to OH GP12.1 permits
LEAK PERCENT**	N/A - Only applicable to OH GP12.1 permits

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature (b) (6) \_\_\_\_\_\_ Date: <u>9-21-2017</u>

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

# LDAR Image Title Form

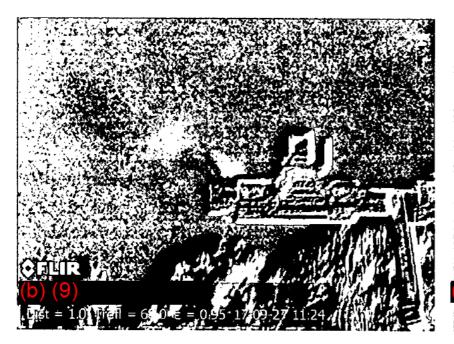




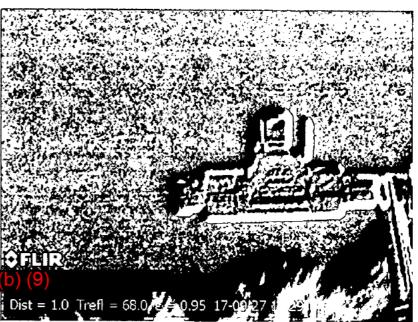
LOCATION	JACOBS	INITIAL SITE PHOTO	DC_0152
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_0153
DATE TESTED	9-27-2017		
SD Card#	Wask 868 C	Witt 1	

Leak	Date	Ī_	R	Di	gital	IR P	icture	IR Movie
1	9-27-2017			DC.	0154	IR_	0155	MOV_ 0156
1	9-27-2017	R	*	DC_	0157	IR.	0158	MOV-0159
2								
				<u> </u>				
3								
4		<del></del>	_	· · · · · · · · · · · · · · · · · · ·				
					<del></del>			
<b>5</b>			<u>-</u> -					
					<u> </u>			
6	·							
, <b>7</b>								
							· · · · · · · · · · · · · · · · · · ·	
8								

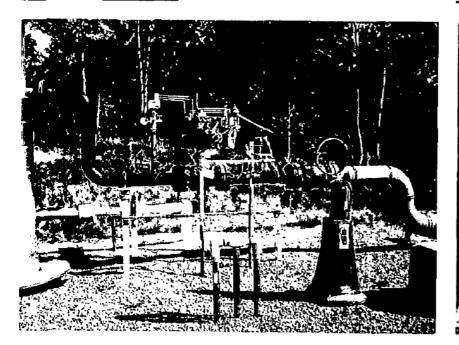
# Fuel Supply Bleed Valve Plug Leak



# Fuel Supply Bleed Valve Plug Repair



### **Initial Site Photo**



# Camera Verification Photo





	<del></del>				
STATION	RICK	MARTEL			
ON-SITE CONTACT		LEMASIZ	ses		
DATE TESTED	-	START TIME	9:10 4	END TIME	9:35 Am
SKY CONDITIONS	CLEAR	AMBIENT TEMP	740	WIND SPEED	9.35" 3 MH
CAMERA MODEL		GFX 320	)		
CAMERA ID NUMBER	}	SN 74900	0102		
CAMERA CERTIFICA	TION DATE	2/27/201	7		W-Baldara and
DAILY VERIFICATION	DATE	9.0	17-2017		
MAXIMUM VIEWING	DISTANCE	25 feet			-
MONITORING COMPA	LNY	RICE PO	SEIDON MIDSTRI	EAM	
MONITORING TECHN	ICIAN	(b) (6)			
TECHNICIAN CERTIF	IED? (Y/N)	YES			
TECHNICIAN YEARS	OF EXPERIENC	E 3	צ' אדנמסח		
	LEAKS DETEC		itional sheets if r		
Western Statement	CEAKS DE IEC	TED (Attach add	itional sneets if i		ve Action
Location Description	Date Detected	Date Repaired a	Camera Model nd ID for Rescan	Descriptio	n <u>For Each</u> empt
1					
2					
3				<u> </u>	
4					
5					
6					
NUMBER OF COMPO	NENTS NOT RE	PAIRED DURING	S INITIAL SCAN (	#)	
ALL UNREPAIRED CO	MPONENTS H	AVE BEEN TAG	GED (√)	NIA	
NUMBER OF DIFFICU	LT-TO-MONITO	R COMPONENT	S SCANNED (#)	6	
NUMBER OF UNSAFE	-TO-MONITOR	COMPONENTS	SCANNED (#)	A	



AT LEAST ONE STILL IMAGE IS ATTACHED (V)	- /,
ALL STILL IMAGES ARE DATED AND GIS ENABLED (V)	V
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	NIA
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	N/A_
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA
*If either plan or path were not followed, please include a written description and explana	ation with this form.

### **ADDITIONAL OHIO CALCULATION:**

 $Leak\% = \frac{ak}{Count_{Gat}} \times 100\%$ 

LEAKER COUNT	N/A - Only applicable to OH GP12.1 permits
ESTIMATED COMPONENT COUNT*	N/A - Only applicable to OH GP12.1 permits
LEAK PERCENT**	N/Λ - Only applicable to OH GP12.1 permits

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

# **LDAR Image Title Form**

Complete one (1) form per wellpad or compressor station.



LOCATION	RICK MARTEL	INITIAL SITE PHOTO	DC-0141
TECHNICIAN	JOHN ROWE	CAMERA VERIFICATION PHOTO	IR_0140
DATE TESTED	9-27-2017		

SD Card #	SANOIST 80B	OH10#1
-----------	-------------	--------

Leak	Date	L R	Digital	IR Picture	IR Movie
1					
2					
					A. M. T.
3					
4					
5					
6					- Wiles
7					
8					

### **Initial Site Photo**



# **Camera Verification Photo**





STATION	ROGER	W. BRO	ww	,		
ON-SITE CONTACT		EMASTE				
DATE TESTED	9-27-17	START TIME		12:30 PM	END TIME	1:00 FM
SKY CONDITIONS	CLEAR	AMBIENT TE	EMP	840	WIND SPEED	1:00 FM 3 MAY
CAMERA MODEL		GFX	320		**************************************	
CAMERA ID NUMBER	2	SN 74	490010	2	-	
CAMERA CERTIFICA	TION DATE	2/27/	/2017			
DAILY VERIFICATION	DATE	9.	27-	ソフ		
MAXIMUM VIEWING	DISTANCE	25 fee	et .			
MONITORING COMPA	NY	RICE	POSEI	DON MIDSTR	EAM	
MONITORING TECHN	ICIAN	(b) (l	6)			
TECHNICIAN CERTIF	IED? (Y/N)	YES				
TECHNICIAN YEARS	OF EXPERIEN	CE 3	nou	1775		
	LEAKS DETEC	TED (Attach	additio	nal sheets if	necessary)	
Location Description	Date Detected	Date Repaired		mera Model D for Rescan	Descriptio	ve Action on <u>For Each</u> empt
1						
2						
3						-
4						
5						1
6						
NUMBER OF COMPO	NENTS NOT RE	EPAIRED DUR	ING IN	IITIAL SCAN	(#)	
ALL UNREPAIRED CO	MPONENTS H	AVE BEEN TA	AGGE	) (<)	NI	4
NUMBER OF DIFFICU	LT-TO-MONITO	OR COMPONE	NTS S	CANNED (#)	(2	
AN IMPED OF UNICASE	TO MONITOR	COMBONEN	TO 00	NIMED (#)		



AT LEAST ONE STILL IMAGE IS ATTACHED (V)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (/)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	NB
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	NA
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* ( )	V,
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NB
*If either plan or path were not followed, please include a written description and expl	anation with this form,

### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{^{ak} \times 100\%}{Count_{Est}}$$

### **LEAKER COUNT**

### **ESTIMATED COMPONENT COUNT\***

### **LEAK PERCENT\*\***

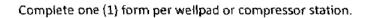
Signature (b) (6)

\_Date: 9-27-20

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly

### LDAR Image Title Form



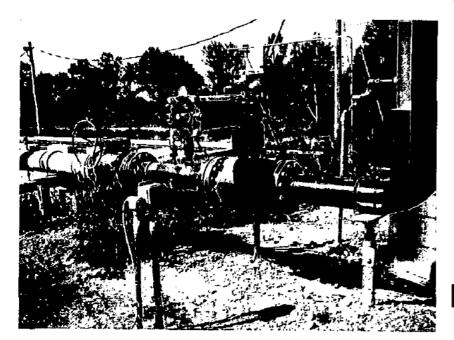


LOCATION	ROSER W. BROWN	INITIAL SITE PHOTO	DC _ 0167
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_0163
DATE TESTED	9-27-2017		-

SD Card # SANOISE 8GB OHIO# 2

Date	L R	Digital	IR Picture	IR Movie
				•

### **Initial Site Photo**



### **Camera Verification Photo**





STATION	דודם	SANTA	NA							
ON-SITE CONTACT	•	1 LEM		ENS						
DATE TESTED	9-27-17	START TIME		A	END TIME	10:20 A				
SKY CONDITIONS	CHEAR	AMBIENT TE	EMP	770	WIND SPEED	10:20 M				
CAMERA MODEL		GFX	320	<u> </u>	-					
CAMERA ID NUMBER		SN 74	4900102	***						
CAMERA CERTIFICAT										
DAILY VERIFICATION DATE 9-27-2017										
MAXIMUM VIEWING D	ISTANCE	25 fee								
MONITORING COMPA	NY	RICE	POSEIDO	ON MIDSTRI	EAM					
MONITORING TECHNI	CIAN	(b) (	6)							
TECHNICIAN CERTIFIE	ED? (Y/N)	YES	_			-				
TECHNICIAN YEARS	OF EXPERIEN	ICE 3	mon	ر ک/ <del>ر</del> د						
	EAKS DETE	CTED (Attach a	additiona	ıl sheets if n	necessary)					
Location Description	Date Detected	Date Repaired	and ID	era Model for Rescan	Descriptio	ve Action n <u>For Each</u> empt				
SABONOR /'BU	9-27-17	8-27-19		370 4900102	RE-MED P	200 /				
2		!	3/4 Z	170000	JINIIZA					
3		_				*				
4						-A				
5										
6										
NUMBER OF COMPON	ENTS NOT R	EPAIRED DUR	RING INIT	IAL SCAN (	#) 0					
ALL UNREPAIRED CO	MPONENTS I	HAVE BEEN TA	AGGED (	<b>√</b> )	NA					
NUMBER OF DIFFICUL	T-TO-MONIT	OR COMPONE	NTS SC	ANNED (#)	0					
NUMBER OF UNSAFE	TO-MONITOS	COMPONENT	TE SCAN	NED (#)	7					



AT LEAST ONE STILL IMAGE IS ATTACHED (✓)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (V)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (~)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA

### **ADDITIONAL OHIO CALCULATION:**

$$Leak\% = \frac{ak \times 100\%}{Count_{Est}}$$

LEAKER COUNT	N/A - Only applicable to OH GP12.1 permits
ESTIMATED COMPONENT COUNT*	N/A - Only applicable to OH GP12.1 permits
LEAK PERCENT**	N/A - Only applicable to OH GP12.1 permits

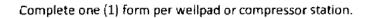
<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.



<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

### **LDAR Image Title Form**



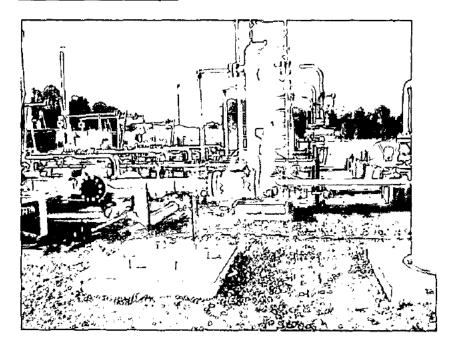


LOCATION	TITO SANTANA	INITIAL SITE PHOTO	DC_ 0143
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	TR_ 0142
DATE TESTED	9-27-2017		

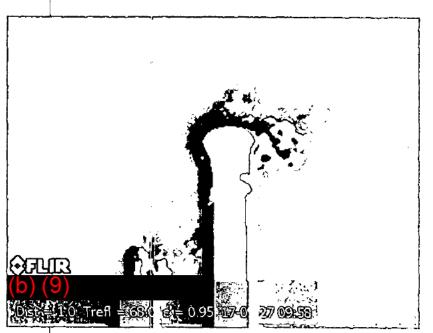
SD Card# SANDISK 868 OHIO 1

Leak	Date	L_R	Digital	IR Picture	IR Movie	
1	9-27-2017	<u></u>	DC_0144	TR_ 0145	MOV _ 0146	
	9-27-2017	R		1	MOV-0149	
2						
3						
4						
5						
6						
7						
8						

### **Initial Site Photo**



# Camera Verification Photo



# Inlet Filter Separator Bleed Valve Leak

# Inlet Filter Separator Bleed Valve Repair



October 25, 2017

Ohio Environmental Protection Agency Division of Air Pollution Control Southeast District Office 2195 Front Street Logan, OH 43138

Re:

Rice Olympus Midstream, LLC

NSPS Subpart OOOOa Annual Report

To whom it may concern:

Rice Olympus Midstream, LLC (Rice) is submitting the attached report for NSPS Subpart OOOOa, as required by 40 CFR §60.5420a(b). This report contains the information specified in §60.5420a(b)(1), (b)(4), (b)(7), and (b)(8).

The report covers the period of August 2, 2016 through August 1, 2017.

Should you have any questions or comments about this submittal, please contact me at (412) 400-6887 or at kristin.ryan@riceenergy.com.

Sincerely,

Kristin Ryan

**Emissions Permitting Specialist** 

Rice Energy, Inc.

Cc:

Director, Air and Radiation Division

US Environmental Protection Agency, Region V

77 West Jackson Boulevard

Chicago, IL 60604-3590

**Enclosures** 



# Rice Olympus Midstream LLC NSPS Subpart OOOOa Annual Report

### **General Information**

Company Name:

Rice Olympus Midstream LLC

Address:

2200 Rice Drive

Canonsburg, PA 15317

Reporting Period					
Start Date End Date					
8/2/2016	8/1/2017				

### **Report Preparer**

Name:

Kristin Ryan

Title:

**Emissions Permitting Coordinator** 

Phone:

412-400-6887

Email:

kristin.ryan@riceenergy.com

### **Certifying Official**

Name:

**Justin Trettel** 

Title:

VP of Midstream Operations and Engineering

Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature

10/25/2017 Date

#### Rice Olympus Midstream LLC NSPS Subpart OOOOa Annual Report

### **Reciprocating Compressor Affected Facilities**

Compressor	Info		Location Info	,					<u>                                     </u>	Cumulative Runtime		
								Runtime Hours as of	Runtime Hours as of	Hours Since Startup or	Records of Deviations	
1	1 1				l		Last Rod Packing	Last Rod Packing	End of Reporting	Last Rod Packing	Occuring Ouring the	
Location	Unit ID	Street Add	ress City	County	State	Initial Startup	Replacement	Replacement	Period	Replacement	Reporting Period <sup>1</sup>	Comments
Goliath CS	C-306	(h) (q)	Beallsville	Monroe	OH	3/16/2016	N/A	N/A	11492	11492	N/A	
Goliath CS	C-307	(D)	Bea lisville	Monroe	QH	3/16/2016	N/A	N/A	11574	11574	N/A	
Goliath CS	C-308	۵	Beallsville	Manros	он	3/16/2016	N/A	N/A	11543	11543	N/A	

1 As specified in 40 CFR 60.5420a(c)(3)(lii).

Rice Drilling B, LLC NSPS Subpart ODOOa Annual Report

# Pneumatic Pump Affected Facilities

	Comments	PE certification ettached	PE certification attached	PE certification attached
	Records of Deviations Occuring During the Reporting Period			
	bathors from the country from the country of country of country of the country of			
	Technically infessible to capture and routs the emissions to the control device of process (X)	×	Х.	×
	No control device or process is available on site (X)			
	number of Pumps	1	-1	1
į	25.	£	8	š
ALC: UNITED STATES	County	Selmont	Belmont	Beimont
STATE OF THE PARTY		Alledonia	Altedonia	Alledonia
redings of present the political of present the political politica	Street Address	(b	)	(5
THE CHILD IN THE PARTY OF THE P	Welste	Conway	George	Thompson

						Commitmes	
				Records of Deviations	Occuring During the	Reporting Parlod	
Control davice or process	was removed and now	technically infleggible to	capture and route the	amingions to another control	davice or process	×	
		Control device or process	was removed and may no capture and route the	emissions to the control.   control for ocass is available   aminsjons to another control	on site	Z	
	New control device and	technically infrasible to	chplure and route the	emissions to the control.	device	(x)	
				New control device and	emissions are controlled	8	
						D dund	
				_		County State	
						County	
						ďΩ	
						Street Address	
						Well Site	

<sup>\*</sup> If the control device is designed to achieve less than 95 percent emissions reduction, specify the percent emissions reductions the control device is designed to achieve.
\*\*As specified in 40 GFR 60 MODA(E) (19)(1).



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

### Diaphragm Pumps

LOCATION

Thompson

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	July 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes, / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED ≠ Yes / No	No
GREENFIELD SITE – Yes / No	No

Comments		•		

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
  - b. Back-pressure on the diaphragm pump exhaust (~8-20 psig) can cause erratic stroke rate as the exhaust is configured to atmospheric conditions.
- 2. Backflash potential and flame propagation if oxygen is present in stainless steel tubing line
  - a. No flame arrestor is currently installed to prevent backflash. Adding a flame arrestor in this application would result in varying degrees of backpressure continuously being held on the system. Also, a blockage could occur if exhaust system to burner is not properly maintained, resulting in erratic pump operation and excessive wear on internals, pump malfunction, or fire exposure.

"I certify that the assessment of technical infeasibility was prepared under my direction or supervision. I further certify that the assessment was conducted and this report was prepared pursuant to the requirements of  $\S60.5393a(b)(5)(iii)$ . Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

Cody Baker
Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

Cork Baker

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

CORY A. HARRIS E-82396



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

### Diaphragm Pumps

LOCATION

George

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	August 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS - Yes / No	No
CONTROLLED – Yes / No	No
GRÉENFIELD SITE - Yes / No	No

Comments	 ***		

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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Facilities Project Engineer
cody.baker@riceenergy.com
Phone: 724-271-7638

ColyBater

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Phone: 724-271-7718

CORY A. HARRIS E-82396

ROM GEORGE



2200 Rice Drive Canonsburg, PA 15317 40 CFR Subpart OOOOa Compliance Plan - Midstream

### Diaphragm Pumps

LOCATION

Conway

911 ADDRESS



COUNTY

Belmont (OH)

NO. OF DIAPHRAGM PUMPS	1
INSTALLED ON	June 2016
APPLICATION	Glycol transfer pump on storage tank
IN USE FOR < 90 DAYS? - Yes / No	Yes – see documentation
ROUTED TO PROCESS – Yes / No	No
CONTROLLED - Yes / No	No
GREENFIELD SITE - Yes / No	No

Comments	100	

Reasons why changes are not technically feasible per 40 CFR 60.5393a(b)(5)(iii):

- 1. No control mechanism on diaphragm pump exhaust line to regen burner
  - a. Varying levels of exhaust gas depending on ΔP, length of stainless tubing run, etc. w/o controls can cause erratic burner operation and can be counterproductive to installed Burner Management Systems (BMS). There is no control mechanism for exhaust gas and this type of installation is not recommended while utilizing the standard *Profire* 2100 BMS.
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Cody Baker Facilities Project Engineer cody.baker@riceenergy.com

Phone: 724-271-7638

Cody Baker

Cory Harris, P.E. Environmental Engineer cory.harris@riceenergy.com

Rhone; 724-271-7718

CORY A. HARRIS E-82396

ROM CONWAY

# Rice Olympus Midstream LLC NSPS Subpart OOOOa Annual Report

### **Fugitive Components at Compressor Stations**

Well Site	Street Address	City	County	State	Date(s) of Monitoring Surveys
Goliath CS	(b) (9)	Beallsville	Monroe	ОН	9/28/2017

### **Fugitive Components at Well Sites**

Well Site	Street Address	City	County	State	Date(s) of Monitoring Surveys
Conway	5/In \ (O)	Alledonia	Belmont	ОН	9/26/2017
George	9	Alledonia	Belmont	ОН	9/26/2017
Thompson		Alledonia	Belmont	ОН	9/25/2017



STATION	GOLIA	TH CO.	MPRESSOR	5777	ov
ON-SITE CONTACT	_	DECKE	_		
DATE TESTED	9-28-17	START TIM	E 10:15-AM	END TIME	2:00 PM
SKY CONDITIONS	CLOUDY	AMBIENT T	EMP 64°	WIND SPEED	3 men
CAMERA MODEL		GFX	320	, III	
CAMERA ID NUMBER	₹	SN 7	4900102		
CAMERA CERTIFICA	TION DATE	2/27	/2017		-
DAILY VERIFICATION	DATE	9	-28-17		
MAXIMUM VIEWING	DISTANCE	25 fe			
MONITORING COMPA	ANY	RICE	POSEIDON MIDSTRE	ЕАМ	
MONITORING TECHN	ICIAN	(b)	(6)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
TECHNICIAN CERTIF	IED? (Y/N)	YES			
TECHNICIAN YEARS	OF EXPERIEN	CE 5	MONOH S		
	LEAKS DETEC		additional sheets if n	eressary)	
Location Description	Date	Date Repaired	Camera Model and ID for Rescan	Corrective Description Atte	re Action n <u>For Each</u> mpt
1 BY INIST YEURS	649-28-17	9-28-17	SN 74900102	RE-TIGHTER	THREO + THRE
2					
3					
4					
5				1	
6					
NUMBER OF COMPO	NENTS NOT RE	PAIRED DU	RING INITIAL SCAN (	<del>-</del> ;	)
ALL UNREPAIRED CO	MPONENTS H	AVE BEEN T	AGGED (✓)	-	A
NUMBER OF DIFFICU	LT-TO-MONITO	OR COMPONE	NTS SCANNED (#)	. 0	.,
NUMBER OF UNSAFE	-TO-MONITOR	COMPONEN	TS SCANNED (#)		



AT LEAST ONE STILL IMAGE IS ATTACHED (V)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (✓)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	<del>-</del>
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (1)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NIA
*If either plan or path were not followed, please include a written description and expla	ination with this form.

### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{a^k \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	N/A - Only applicable to OH wellpads
ESTIMATED COMPONENT COUNT*	N/A - Only applicable to OH wellpads
LEAK PERCENT**	N/A - Only applicable to OH wellpads

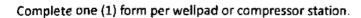
<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.



\_Date: <u>9-28-201</u>7

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

### LDAR Image Title Form





LOCATION	60LIAM	INITIAL SITE PHOTO	06-0164
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	TR-0165
DATE TESTED	9-28-2017		

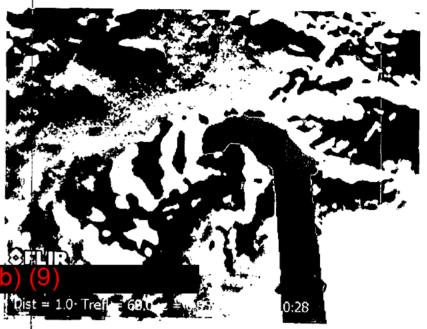
SD Card# SANDISK 16 6B 60LIATH

Leak	Date	L R	<del></del>	IR Picture	IR Movie
1	9-28-2017	LEAK	x-0166	TR-0167	MOV_0/68 MOV_0/72
	9-28-2017	REPAIR	K-0170	TR_0071	MOV-0/72
2			S		
3					
4					
5					
6					
7					
8					

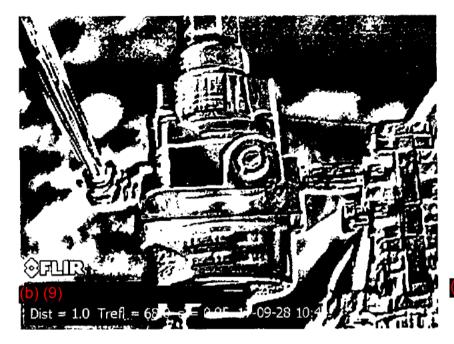
# **Initial Site Photo**



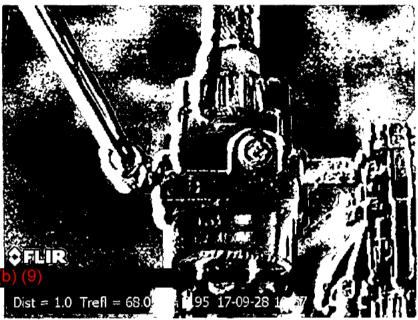
# **Camera Verification Photo**



### Inlet Scrubber Blowdown #4 Leak



# Inlet Scrubber Blowdown #4 Repair





STATION	Carun	<del>\$</del> Y				
ON-SITE CONTACT	J,C, J	OYNE	ov		•	
DATE TESTED	9-26-17	START 1	IME	10:25	END TIME	11:15 Am
SKY CONDITIONS	CLEAR	AMBIEN	T TEMP	770	WIND SPEED	1 MPH
CAMERA MODEL			GFX 320			
CAMERA ID NUMBER	}	5	5N 7490010	2	T 16 to	
CAMERA CERTIFICA	TION DATE		2/27/2017			
DAILY VERIFICATION	DATE		9-26-	2017		
MAXIMUM VIEWING I	DISTANCE		S feet	<del></del>		
MONITORING COMPA	ANY	[F	RICE POSE	IDON MIDSTR	EAM	
MONITORING TECHN		· (b	o) (9)			
TECHNICIAN CERTIF	IED? (Y/N)	_	(ES		ø	
TECHNICIAN YEARS	OF EXPERIEN	CE	3 mous			
	LEAVO DETEC		·			
	LEAKS DETEC				necessary)  Corrective	e Action
Location Description	Date Detected	Date Repaire	1	mera Model ID for Rescan	Description	n <i>Eor Each</i>
1 SAUGE BUSHING	9-26-47	9-26-1	- I	X 320 74900/02	RE-TAPED	ETIGHTEMO USHING
THE CALL ENGINE			OLY	32C 14900102	GREASED FIL	
3						
4						
5						
6						
NUMBER OF COMPO	NENTS NOT R	EPAIRED	DURING I	NITIAL SCAN	(#)	
ALL UNREPAIRED CO	OMPONENTS H	IAVE BEE	N TAGGE	D (✓)		
NUMBER OF DIFFICU	LT-TO-MONITO	OR COMP	ONENTS	SCANNED (#)	0	
NUMBER OF LINSAFF	TO-MONITOR	COMPON	JENTS SC	ANNED (#)	$\overline{\Lambda}$	



AT LEAST ONE STILL IMAGE IS ATTACHED (1)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (✓)	V
LEAKER STILL IMAGES ARE ATTACHED (✓ or N/A)	
REPAIR STILL IMAGES ARE ATTACHED (✓ or N/A)	
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (~)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NIA

### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{ak \times 100\%}{Count_{Est}}$ 

LEAKER COUNT	N/A - Only applicable to GP12.1 wellpads			
ESTIMATED COMPONENT COUNT*	N/A - Only applicable to GP12.1 wellpads			
LEAK PERCENT**	N/A - Only applicable to GP12.1 wellpads			

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

### LDAR Image Title Form

Complete one (1) form per wellpad or compressor station

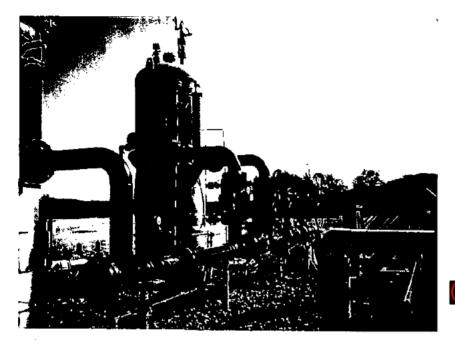


LOCATION	CONWAY	INITIAL SITE PHOTO	TX _ 0121
TECHNICIAN	(b) (6)	CAMERA VERIFICATION PHOTO	IR_OIZO
DATE TESTED	9-26-2017		

SD Card# SANDISK 86B ONIO#3

Leak	Date	L R	Digital	IR Picture	IR Movie
1	9-26-2017	<u></u>	DC_0123	IR_0122	MOV_ 0124
	9-26-2017	R	DC_0121	IR_0128	MOV-0130
2	9.76.2017	<u></u>	DC_0126	IR-0125	MOV-0127
	10-3-2017	R	DC-0176	TR_0177	MOV_0178
. 3		<u> </u>	1		
4		- <u></u>		<del> </del>	<u> </u>
	<del>                                     </del>		<del> </del>		
5		<del></del>		_	
	<u> </u>		_		
6					
			<u> </u>		·
7					
8				<u> </u>	
	<u> </u>				

### **Initial Site Photo**



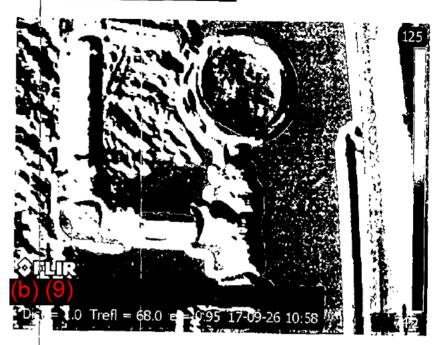
# **Camera Verification Photo**



# **Gauge Bushing Leak**



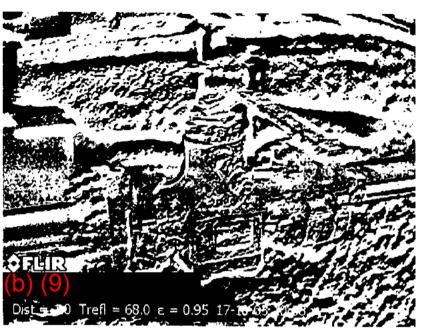
# Gauge Bushing Repair



# **Grease Fitting Leak**



# **Grease Fitting Repair**





STATION	GEER	6E_			
ON-SITE CONTACT	J.C. J	OYNSON			
DATE TESTED	9-26-17	START TIME	11:30 Am	END TIME	11:55 m
SKY CONDITIONS	CHERR	AMBIENT TEMP	82	WIND SPEED	2 MPH
CAMERA MODEL		GFX 320		<u> </u>	
CAMERA ID NUMBER	₹	SN 7490010	2		
CAMERA CERTIFICA	TION DATE	2/27/2017		<u> </u>	
DAILY VERIFICATION	N DATE	9-26	-2017		
MAXIMUM VIEWING	DISTANCE	25 feet			
MONITORING COMP	ANY	RICE POSE	IDON MIDSTR	EAM	
MONITORING TECHN	IICIAN	(b) (6)			
TECHNICIAN CERTIF	IED? (Y/N)	YES			
TECHNICIAN YEARS	OF EXPERIENC	CE 3-mo	WTHS		
	<del></del> , _			<del>/</del>	

Location Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1				
2		-		
3				
4				
5				
6				

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	0
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (1/)	NA
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	$\mathcal{L}_{\mathcal{Q}}$
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



AT LEAST ONE STILL IMAGE IS ATTACHED (1)	
ALL STILL IMAGES ARE DATED AND GIS ENABLED (1)	
LEAKER STILL IMAGES ARE ATTACHED ( or N/A)	NA
REPAIR STILL IMAGES ARE ATTACHED ( or N/A)	N/A
MONITORING PLAN AND OBSERVATION PATH WERE FOLLOWED* (✓)	
DELAY OF REPAIR FORMS COMPLETE ( or N/A)	NA

### ADDITIONAL OHIO CALCULATION:

 $Leak\% = \frac{^{ak} \times 100\%}{Count_{Est}}$ 

LEAKER COUNT				 	
ESTIMATED COMPONENT COUNT*					
LEAK PERCENT**		 	 		

<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

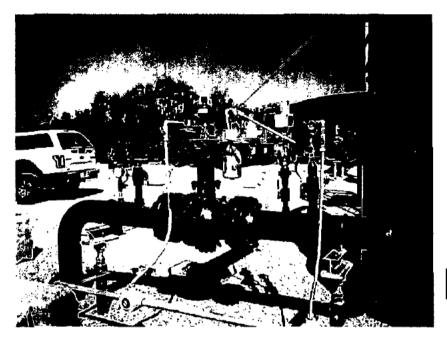
# LDAR Image Title Form

Complete one (1) form per wellpad or compressor station.



OCATION		GEDI	REE	!	INITIAL SITE PHOTO	DC_0133
rechnicia!	_	(b) (6)			CAMERA VERIFICATION PHOTO	IR_0132
DATE TEST	ED	9-24	ia - 20	217		
	· · · · · · · · · · · · · · · · · · ·		<del>-</del>	بد	•	
SD Card #	SANDE	'st 8	'6 <u>B</u>	OHIO T	3	
Leak	Date	L	R	Digital	IR Picture	IR Movie
1						
		<u> </u>	! !			
2					1	
		<del></del>				
3			ĺ			,
		-	-			
4		-				
5		_	-	·	,	
6						
-		_	.			
7	_ <del></del>					

# **Initial Site Photo**



# **Camera Verification Photo**





STATION	THOMP	50N					
ON-SITE CONTACT	SHANE	MURRA	$\forall$				
DATE TESTED	9-25-17	START TIME	2:00 PM	END TIME	2:25-0		
SKY CONDITIONS	CHEBR	AMBIENT TEMP	830	WIND SPEED	2 mp4		
CAMERA MODEL		GFX 320					
CAMERA ID NUMBER	SN 7490010	SN 74900102					
CAMERA CERTIFICAT	TION DATE	2/27/2017					
DAILY VERIFICATION	DATE	9-25	-2017				
MAXIMUM VIEWING D	DISTANCE	25 feet	25 feet				
MONITORING COMPA	INY	RICE POSE	IDON MIDSTR	EAM			
MONITORING TECHN	ICIAN	(b) (6)					
TECHNICIAN CERTIFI	ED? (Y/N)	YES	<del></del>				
TECHNICIAN YEARS	OF-EXPERIENC	CE 3 mai	1745				

Location Description	Date Detected	Date Repaired	Camera Model and ID for Rescan	Corrective Action Description <u>For Each</u> Attempt
1				
2				
3				
4				
5		-		
6				

NUMBER OF COMPONENTS NOT REPAIRED DURING INITIAL SCAN (#)	$O^{\cdot}$
ALL UNREPAIRED COMPONENTS HAVE BEEN TAGGED (/)	NA
NUMBER OF DIFFICULT-TO-MONITOR COMPONENTS SCANNED (#)	
NUMBER OF UNSAFE-TO-MONITOR COMPONENTS SCANNED (#)	0



NA
N/A
N/A

### ADDITIONAL OHIO CALCULATION:

$$Leak\% = \frac{ak \times 100\%}{Count_{Est}}$$

LEAKER COUNT	
ESTIMATED COMPONENT COUNT*	
LEAK PERCENT**	

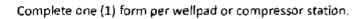
<sup>\*</sup>Provided by Emission Permitting Specialist or Coordinator; estimated using Subpart W population count factors.

Signature: (b) (6) \_\_\_\_\_\_ Date: \_9-25-2017

<sup>\*</sup>If either plan or path were not followed, please include a written description and explanation with this form.

<sup>\*\*</sup> If Leak Percent is greater than 2.0%, increase monitoring frequency to quarterly.

# LDAR Image Title Form





LOCATION TECHNICIAI DATE TESTI	V	Homeso 0) (6) 9-25-	CA	NITIAL SITE PHOTO MERA VERIFICATION PHOTO	DC-0104 IR-0105				
SD Card# SANDISK 86B 0410#2									
Leak 1	Date	L R	Digital	IR Picture	IR Movie				
2									
3									
4									
5									
6									
7									
8									

# **Initial Site Photo**



# **Camera Verification Photo**

